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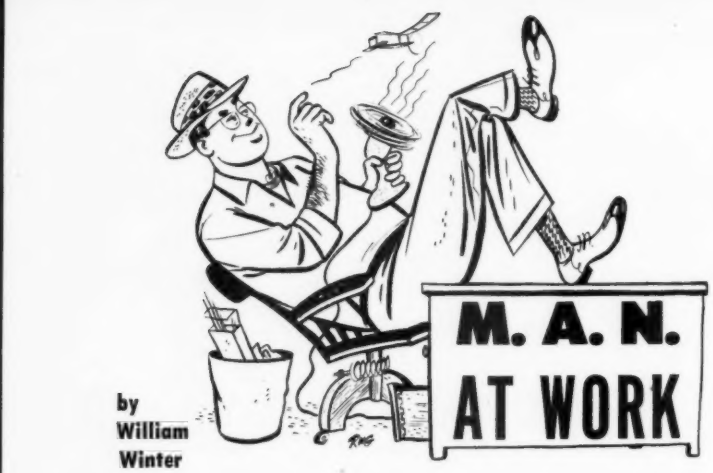

by William Winter

▸ Jim Clem, who teams up with Jim Dugger in speed at Dallas, just breezed out of here (visiting modelers make M.A.N. a port of call) after an enlightening (for us) bull session. Jim has built indoors, rubber and free flight, turned to speed in recent years. Reminds you that speed boys are modelers like the rest of us. Perhaps better ones.

▸ Clem and Dugger have developed plywood airplanes. One thirty-second ply is used on top and bottom of the wing, and 3/16" for the fuselage. At a recent contest they had a take-off accident, the ship going high on the lines and overhead. This usually spells curtains. The prop was replaced and the airplane flown in the same contest. When you talk speed, you talk hot engines. Some hearty laughs out of Jim's stories about rumors of ways to "hot up" engines and what sometimes happens when you do. Some hot ideas gave 1,000 less rpm. And, like any speed man who has heard Grish's engines run, Jim fell to talking about Tony and his record flight this year at the Nationals. Now we hear that Tony showed the boys that engine after it was opened for inspection. They couldn't see anything! Tony had burned out the piston on that flight. When he put in the new piston, he gave it a couple of swipes with a file. That's what gets everybody; he makes it look so easy, yet has engines that top anything. Wonder how many competitors realize that Grish refrains from competing in speed events other than B?

▸ Polk's lent us three diesels to try. While they stock a variety of diesels, including the famous Mills, we picked out three E.C.'s, a one cc, a two cc and a 2.46 cc. To figure this out, keep in mind that 10 cc equals a displacement of .60. So the two cc is about the same as .12 and the 2.46 about the same as a .15. Well, this particular two cc E.D. (the Special) was an old-fashioned stove pipe affair which we declined to try on the rc job until Joe Dale told us it had held a British speed record. Now pull up a chair.

▸ This radio model had an Arden. *.09*. The airplane had been underpowered purposely after a house creamed a bigger ship. Then we wanted to fly in winds so started a search for more power. Trouble with American engines is that mysterious gap between an *.09* and a *.19*. Our Arden *.09* had turned an 8 x 6 for best results and the two cc diesel took a minimum of 10 x 6 and would take more but the dihedral wasn't designed for so much torque. It is hard to judge what a slower-turning more powerful engine really does until you fly. You have to judge by what it does to the airplane.

▸ Yesterday we flew the 54 inch rc from a windy hill top. The wind was 25 mph with gusts to 35 at LaGuardia and on that hill top we had passing snow squalls. The two cc took the plane about 500 feet up wind on a two-minute run, let us perform numerous small turns and one 360 without drift. The mixture was terrible, yet it didn't seem to matter. The bigger prop really takes hold. How easy does it start?

▸ Our English cousins insist they start better than a glow plug. This is fantasy. Maybe it is the fuel mixture but we can't start them on a flip or even a couple of flips. The mixture was two parts castor, two parts kerosene, one part ether. In the cold yesterday, the engine wouldn't start at all until the ether was raised from one part to two, or a total of 33 per cent of the mixture. Starting then was about the same as glow in that temperature. Right now we have a fond regard for that ugly looking Limey diesel. Have had no vibration problem with the radio relay either. So far have been too busy flying that stilty looking two cc to finish tests but will have more dope anon.

▸ Couple of weeks ago threw the rc in the back seat and went looking for model flying. Saw some people in the center of an enormous field at Hicksville—New Yorkers take note. Were they looking over ground for a housing development? Just then the sun flashed on a wing. Hot dog! Turns out the *Screamin' Demons* were having a club contest. Fairly windy so that the free flights drifted a half mile or more.

(Continued on page 46)

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Do you remember when the supersonic wall of 120 mph was the thing to crack? Anytime a speed demon, such as Newberger of Kramer, would get up around 125 or so, everyone's nose would try to get under the cowl to see what made it tick. Props were whittled, fuels were mixed, and compression ratios were constantly being changed. Heads were popping off, rods were grunting, and gaskets would give up in despair. It got so any engine with a stock spark plug, carrying the coil, condenser, batteries, and all the other garbage needed to make it go, was in there dieseling along with the best glo-plug that ever hit the market. Everything was in top shape to crack that record until flight time reared its ugly head. Instantly everything went wrong. It always seemed the engine was either starving for fuel or blubbering with too much being crammed down its throat. So everyone started to work on tanks. Dunning had a slick ship that was turned out of magnesium (this was a little later) and screwed together near the trailing edge of the wing. The fuselage had two bulkheads in it, making it fuel tight. A line ran to the metering jet from the tank area, and another one was used for a filler. The small breather hole was also there of course. This all-metal ship really did the job and gave the new Dooling *61* all the fuel it could use.

Wallick and Thomas teamed up and installed a long, high, narrow tank with the fuel pick-up line near the outboard center of the tank and shattered a record set by Mathews of Alameda. Mathews used a *Hornet* engine and incorporated a single-bladed counter-balanced prop. We don't know exactly who came out with the now practically standard speed tank, but to get to the meat of the yarn, we're not doubting that polishing here and there or pressurizing and doing other work helped, but to say it all in one sentence—"A simple stock tank and stock engine, with good fuel and prop, will give the best speed merchant in the business plenty to worry about."

• • •

Denny "Hogan" Davis has a new design, called the *Beanburner*. After watching a few flights we decided the name ought to be changed to *Screamburner*. Sure is hot! It has the *"Davis"* (not the Davis) section, which is 9-1/2 per cent thick, and carries 570 square inches of wing area, diagonally braced. The stabilizer area is 46 per cent of the wing. A Dooling *29* swings the 9-6 wider bladed job Power Prop. The fuselage is an even 40" and is silk covered as is the wing. The stab is covered with Jap tissue. The nose moment arm is rather short and the engine cowl, spinner, and fuse all fare in very smoothly. A K & B shut-off is incorporated with a Hillcrest timer to kill the engine. Another Hillcrest timer is used to release the parachute for dethermalizing duties, which, we might add, is very often used after a 20-second engine run. Denny is definitely a believer in the thinner flat-bottomed section and that climb he gets is a darned good reason. The *Beanburner* designer is plugging for a six-minute time limit on flights now. He seems to think, and we agree in some cases, that consistency of flights should be encouraged more. "Some of the smaller fields that are used for contest sites should warrant some thought for the six-minute limit," stated Davis. He also thought the addition of another official flight would be a very good idea. This would not take up any more time than the three ten-minute attempts if thermals were hooked on the longer attempts. In cases of a tie, a last flight could be made with no time limit. Looks from here as if many of the hands are in favor of consistency in flights.

• • •

At the Furstenfeldbruck Air Base in

Bill Butler's super stunt radio model has full elevators with 20% up and down. Torp .29.

Beanburner, Denny Davis' 570 sq. in., Dooling .29-powered free flight. The stab is 46%.

by Jim Saftig

MODELS, MODELERS—BY MAN WHO GETS AROUND

Germany the NATO forces are flight-conscious even during off-duty time. Over fifty American civilian and military model fans at the 36th Fighter-Bomber Wing make up the *Prop Busters Club*. This club holds bi-monthly gatherings, sponsors exhibition flying stunts, and promotes "pixie" aircraft in general. Members from 12 years of age on up. Everything is built by these versatile members from the solid, stationary, to the gas-powered variety. A common sight on Wednesday and Sunday afternoons is to see the *Prop Busters* scrambling around the Airmen Service Club's "flying circle" after the free-flight jobs. Exhibition flying between halves of football games and the sale of model kits and other supplies are other club activities. The idea of putting models before as many people as possible is undoubtedly furthering enthusiasm among non-members. In June of 1952 this organization hopes to be host to the Twelfth Air Force Command model meet. At this big shindig, representatives will be chosen to compete in the Air Force Nationals in the United States.

• • •

Harold deBolt and George Swank took in the Canadian Nationals and came home with first and second in R/C event. The Canadian lads were very impressed with the C/S rig and couldn't believe the range factor. The objective flights were fairly simple, involving flying out to a tree one-half mile away and circling it for the return leg. The Canadians were using the E. D. 27 meg. radios almost exclusively. deBolt tells us he was impressed by the models they were flying. Most of them were using the British Vernon *Skyscooter* kit job. It is a cute looking little 310 square inch model rather similar to a Luscombe four place job. They powered it with small diesels such as the *.09 Mills*, Albon or E. D. and there was no lack of power. The Canadian lads were flying their ships in a very small area and were doing all of their stuff at about 30 feet of altitude. In watching the performance, one was reminded of a control line stunt model. The manuevering was done right over your head in a very tight and snappy manner. The area used for flying was no greater than a football field at most.

• • •

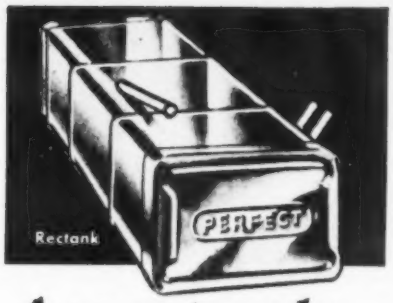
We practically climbed inside Bill "W6JX" Butler's R/C ship at Corona Del Mar air strip a week or so ago. Bill has a three channel Rockwood ship with the receiver mounted vertically on a sponge rubber. The ship has full span (of stab) elevators two inches wide with 20 degrees of up and down movement. This versatile ship has elevator control, engine control (two speed) and cut-off. It uses three Bonner escapements. The Torpedo 29 is more than enough power and the action is terrific. Bill uses the stock 6 foot *Rudderbug* wing and is having wonderful success with the rig. To date, everything in the book hasn't been tried but it won't be long. We enjoy the way Butler checks his rig. Instead of carrying it out (off the end of his antenna) and checking his tuning, Bill just launches the ship on neutral and then tunes in while the ship is in flight. Guess some flyers like to live dangerously!

• • •

The Plymouth Corporation has sponsored a combat group to travel around the country for the purpose of staging a model show. These exhibitions do much to popularize the hobby and have educational value particularly useful to new clubs in their efforts to secure the backing and support of their local authorities and civic organizations. We are happy to report that many clubs all over the world are putting on exhibition flights whenever and wherever possible. Looks like we have to go back to the old maestro himself, Jim Walker, to find where (*Continued on page* 8)

Chuck Schuette's Torp 19 speed model. Dolly size makes plane look like a flying engine.

Guess who? Joe Kovel, the K of the old KG! Joined MAN at Work with beauty of a payload.



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7	2/3	1"x	1-1/2"x	1-1/4"	up to .23	49c
8	1-1/4	1"x	1-1/2"x	2"	up to .35	49c
9	2	1"x	1-1/2"x	3"	up to .39	59c
10	2-1/3	1-1/8"x	2-1/4"x	2"	up to .51	59c
11	4	1-1/8"x	2-1/4"x	3-1/2"	up to .65	69c
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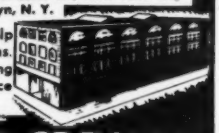

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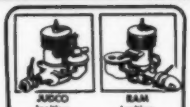

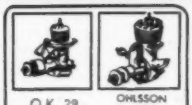

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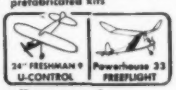

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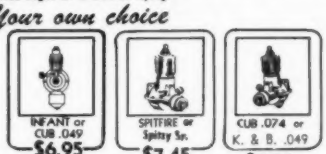

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SCRAP BOX

(*Continued from page 5*)

the roots of such exhibitions started.

• • •

The Plymouth Corporation is not slackening the pace to keep modeling uppermost in the minds of youngsters all over the world. Recently, the *Syracuse Controliners Club* gained the interest of the local Plymouth dealers and have secured an excellent meeting place. The dealers' main interest is to start the youngsters building ships of all types and they have furnished work benches and the where-with-all to get the job done. instructions are given and constructive "bull sessions" are held in conjunction with the building program. One of the dealers has cleared the deck and has made an indoor flying site in his garage. Future plans by these swell dealers include a seven circle u-control area and free flight field plus P.A.L. t-shirts which will be available by the next contest season.

• • •

Frederich R. Hamlen of Dover, Mass., has some noteworthy comments to make in the promotion of the glider events. "The interest throughout most of the country, with the exception of a few 'hot spots' has dwindled to a very low ebb. We have a few good glider men but even their examples, when held up to the European ones, are pretty sorry! I propose that the A.M.A. recognizes the F.A.I. rules so that we can proceed with the design of Nordic gliders and compete with the foreign nations." Hamlen goes on to state that he is going to contact the officers of the many clubs in the New England area to see if it is not possible to include in the 1952 contests, a special A/2 event in which F.A.I. rules will be recognized. This is what the A.M.A. decided to do with the Wakefield event, and he feels that all hands figure it has already improved the calibre of our machines. Wakefield interest is running extremely high in the Boston area, with the emphasis entirely upon experimental ships. Ed Dolby of Rockland paved the way in something new when he arranged a Wakefield challenge meet between Boston and N.Y.C. All Wakefield rules were observed and all fliers were up before dawn to run off the three rounds. The three top fliers' times were added for each team to get the final results. N.Y.C. came out on top by approximately 100 seconds. The times were pretty fair in spite of the rain, but the important point was that all had a chance to talk to one another about various modeling problems. Hamlen feels the Team event could work in a similar manner for the A/2 Glider event. Thanks for the comments, Hamlen. We feel that there are plenty of top glider men in the U.S. who are out flying mainly for "kicks." True, organizing the lads into groups and getting the newer hands on the ball is definitely a problem that can be mainly overcome by getting them together in competition whenever possible. Many of the free flight men in the California areas are pretty sharp glider men but they concentrate on the gassies more due to the mass competition, or so it seems.

• • •

The enthusiasm and competitive spirit that was shown some time back when the Wakefield fliers and the gas powered f-f boys locked horns was terrific. The time limit was set at five minutes per flight, but whatta battle! The "drat" rubber motor failed on one of the rubber men's ship on the last flight with just a couple of minutes difference in time, or it might have been a win for the five-man rubber team instead of the five-man gas powered team. Never thought we'd see the day when a contest, even though it was small but not wanting for experts in each class, brought together rubber vs. gas power.

• • •

Pop Robbers keeps us posted on what's going on up north. The *Western Associated Modelers* are a well organized bunch of clubs. They are kept up to date on all activities and have put many excellent rules into use. One of their motions pertains to all control line combat model planes. It states that they must be flown with stranded control lines. Minimum size lines for class AB combat models is .018 diameter. Length of lines for class AB combat models must be such that the distance from the center of grip of the control handle is exactly 60 feet from the center of the model. The stranded line idea for combat is definitely a big step in the right direction. Since combat flying is becoming so popular a safety factor was greatly needed.

• • •

We sniffed around Frank Serio's garage a short time back and watched the "metal bender" at work. Frank had just about completed a new mostly metal team racer which carried out some of his usual good ideas. The ship's fuselage was made of .012 dural. After making stiff paper templates, the dural was laid out to form the sides, top, and bottom. Using a vise and an old broom handle, Frank proceeded to radius in the flat bottom and sides of the fuse, then formed the rounded top. The lapped top was tapered back and split just forward of the rudder, which was made into the original fuselage layout template. The rounded top of the fuselage was trimmed off just aft of the cockpit area and a separate piece was cut for the front engine and tank covering. The front covering formed over the original flat side layout and butted flush against a wrap-around lower cowl section that flared back on the underside to the middle of the wing. Two louvres were cut out just aft of the lower cowl section and another piece of .012 was formed to make a force draft escape for exhaust and oil waste. A masterpiece of engineering was the firewall, wing, spar brace, landing gear brace, and engine bearers. This one piece of .040 24 ST practically holds the whole ship together. A balsa nose block with plywood backing was shaped and bolted to the extended flaps of the fuse. The gear was made "Key" style and was riveted to the combination firewall, etc. The elevators and stab were made of balsa. A piece of 1/8 plywood sheet was formed and fitted into place just forward of the rudder. This was held in place by a formed piece of .012 dural. The elevator spar was slipped through, aft of the stabilizer, after the tail horn had been installed. The elevators were then glued on the spar followed by the usual linen hinges. The hardwood wing spar was tapered and installed in the ship. Two bolts held it in place with the help of the laps which were formed into the engine bearers. The wings themselves were just lapped over .012 dural which had been cut to form a nice pair of tapered beauties. The lead out side of the wing had a piece of .052 dural formed to shape a flat tip. This was riveted on after it had been filed to shape and had two slots cut to allow the leadouts to come through. The bell crank was bolted on the wing spar and the ship was practically ready for flight. The first flights of Frank's original (we just explained ship two here) team racer were over the 100 mph marker.

• • •

Just saw Howard Bonner's latest gimmick —a steerable tail wheel for his radio job. The hard balsa rod running to the rudder U has had an extra U added just over the location of the tail wheel. A brace has been made and fitted to the aft bulkhead in the ship. This brace supports a metal former with a soldered tube running vertically. The tail wheel wire runs vertically through the tube and has a washer soldered just above and below the tube to allow the wheel to turn freely. A bend in the tail wheel wire fits into the extra U on the rudder control push rod. When rudder is given either way, the tail wheel steers the ship in that direction. With this engine control set-up and steerable tail wheel, Bonner was taxiing out to the center of the field, changing the engine to high speed and making beautiful take-offs.

• • •

Consolidated Vultee Aircraft, San Diego, has lifted the veil of secrecy on its jet propelled, supersonic, water-based aircraft. This incorporate the proven aerodynamic advantages of the Consolidated Vultee developed delta wing and the entirely new hydrodynamic concept of a blended wing-and-hull design. Through this design approach coupled with the development of an extremely effective (water) spray suspension device known as the "spray ram," it has been possible to use high-speed forms without handicaps.

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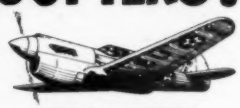
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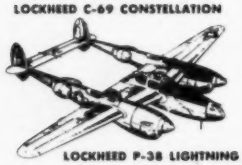
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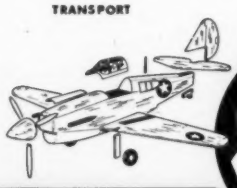

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Picture studies of the model show important features, including the 25ST or 17ST metal landing gear, easy-to-reach needle valve for the "23," lead-outs and the guides near the tip. Color scheme is Air Force Artic: all silver with red wingtips and tail surfaces.

THE BEAVER

Designed for engines of .19-.35 displacement this rugged scale job of Canada's De Havilland cabin plane combines simplicity and flyability. Proportions adaptable for free flight and for rc.

by DICK STRUHL

As the subject for a scale control liner, the De Havilland *Beaver* leaves very little to be desired. The ruggedness and dependability found in the big plane are equally duplicated in our 3/4" to 1' scale model. With its straight lines and square fuselage, the construction is as simple as any box-car to take the air. And yet a mere glance at the model is sufficient to tell you that the *Beaver* is no box.

Our model is built around an Ohlsson *23*, but you can look forward to good performance with any glow plug engine of .19 to .35 displacement. For larger engines we would recommend increasing the size by 1/4 to make a 1" to 1' scale resulting in a 48" wing span model.

The full size aircraft is detailed in the June 1951 issue of MODEL AIRPLANE NEWS so no words are needed on that score. May we suggest that you obtain the full size plans before starting construction? Study the plans carefully and read the construction details thoroughly several times and we are sure that you will have no difficulty.

The fuselage is constructed by cutting two side panels from medium grade 3/16" sheet balsa as shown in the side view. You may butt join two sheets to obtain the necessary width. The top and bottom of the fuselage are cut from 1/4" sheet by 3" wide. Although the fuselage is over 3" in width, allowing for the rounded corners, the 3" width sheet is sufficient. Cement the fuselage together and allow to dry thoroughly.

The landing gear is now cut and bent to the shape shown. You may use 25ST or 17ST for this member. Bolt the landing gear to the top surface of the fuselage bottom. Use very large (at least 1/2" dia.) washers next to the balsa. If you cannot obtain these large washers you may in-lay 3/4" squares of 1/16" plywood to act as washers.

The engine bearers are spaced to suit your own engine. The spacing shown in the plans is for the Ohlsson *23*. Fill-in between the bearers and the fuselage sides with 1/2" hard balsa. You may install the 3" Veco bellcrank at this time. Install the gas tank above the engine bearers and just aft of the firewall position. Now carve the cowl block to shape, hollow out if necessary and cement in place. Before filling in the 1/4" sheet firewall, slip the gas and filler lines in place on the gas tank.

Dick cranks up. Uses a small plate near outer tip during tests to make sure new model holds out.

Note that the firewall below the engine bearers is a double layer of 1/4" sheet. This is to allow the trimming away of the fuselage sides to the shape of the rear of the cowling.

For maximum strength we recommend that you paint the side windows in place rather than cutting them out and installing celluloid. The windshield is celluloid and is installed in place after the wing is set on the fuselage.

The cowling may be purchased if you are lucky enough to find a spun aluminum one of the proper size, or turned from a block of hardwood or built up as shown. To build the cowl, cut three rings from 1/4" sheet balsa as shown and connect with soft 1/16" sheet balsa and sand to the proper cross section. It was found necessary to add a 1/16" plywood disc to the third cowl bulkhead for strength due to cutting away for engine space. The cowl may be attached with dress snaps or other hooks.

Cut the tail surfaces to the proper shape as shown in the plans. Use only warp-free 1/16" plywood for these members. You will note the stabilizer is made in one piece. Cement the tape hinges in place and then add the control horn. You may use a Veco horn unit or make your own from music wire and sheet tin. The two elevators are connected together *below* the center section of the stabilizer with enough clearance to allow a 35 degree up movement. Connect the push rod to the elevator control horn before cementing the stabilizer in place. Now connect the push rod to the bellcrank. The rudder is cemented into the slot provided for it in the fuselage top. Cut only the horizontal portion of the rudder hinge line and crack the rudder to give the proper offset.

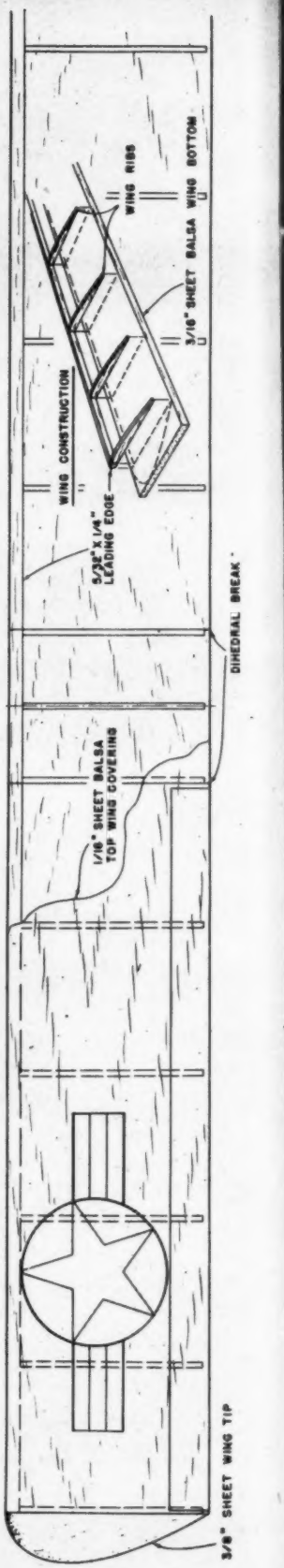
You may now add the rubber tired tail wheel. Bend the strut to shape from 1/16" steel wire and cement in place with to gauze to strengthen.

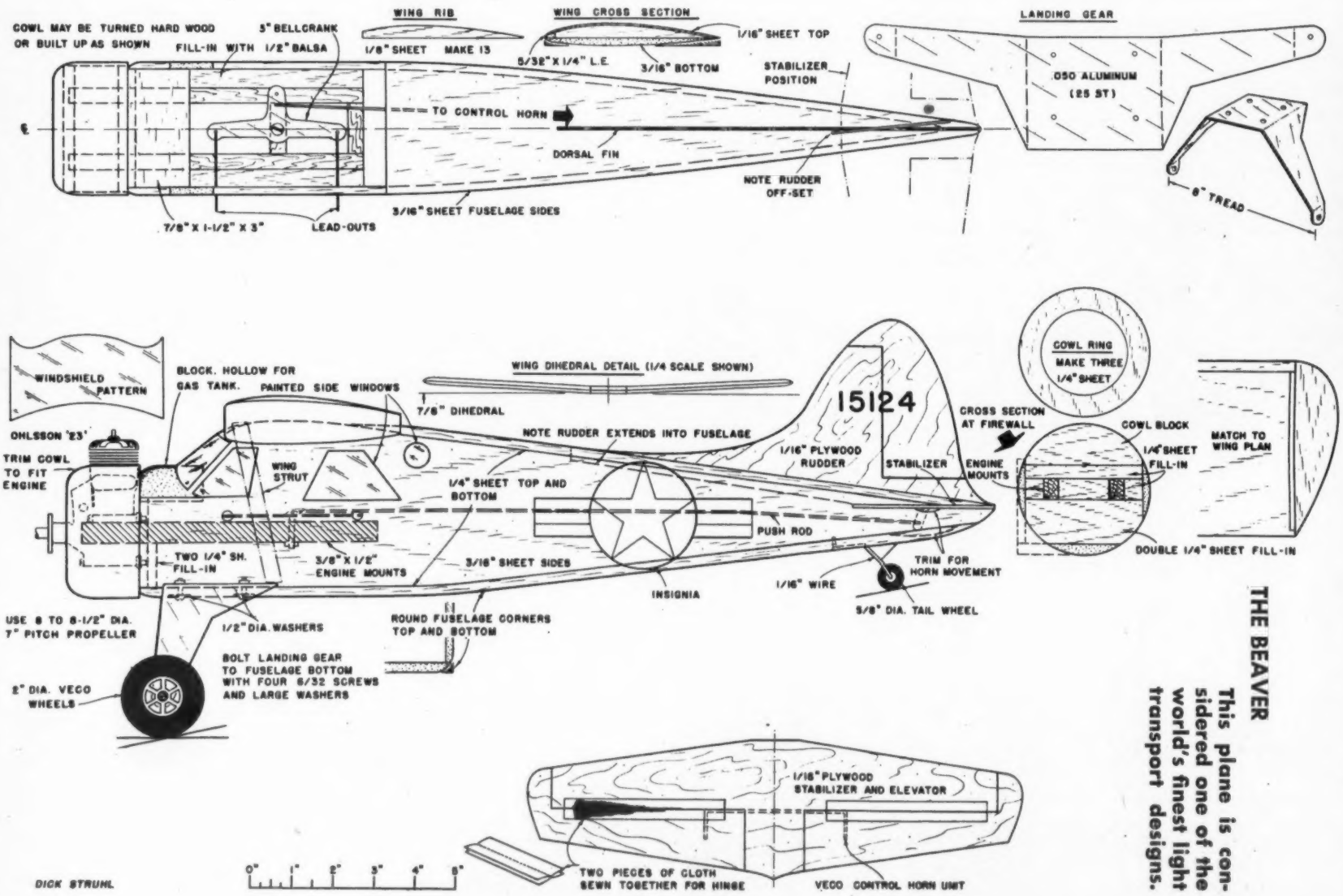
The wing is relatively simple to construct. Butt join two pieces of 3/16" sheet balsa to obtain the necessary width. While the cement is drying cut out the 13 required ribs from 1/8" sheet balsa. Now draw the wingtip and rib locations on the 3/16" sheet bottom. Crack at the dihedral break position and install the necessary 7/8" under each tip. Cement the 5/32" x 1/4" leading edge and then add the ribs. Be sure to add several coats of cement over the dihedral joints. When all the cement has set, cover the top of the wing with flexible 1/16" sheet. Fill in the wingtip position with 3/8" soft sheet balsa and trim to shape. To obtain the under surface of the wing, use either a very sharp block plane or a sandpaper block with very rough paper (such as No. 2). It requires only a very few strokes with this rough paper to get down to the required cross section. Finish off with 2/0 sandpaper.

Check the gas tank, the landing gear installation and the bellcrank. Add the lead out wires to the bellcrank and then cement the wing in place with several coats of cement. The wingtip wire guide should now be added.

The model should be sandpapered smooth over all. When rounding the fuselage corners be sure that you keep the lines straight and avoid ridges and valleys. Brush on two or three coats of wood filler to fill the grain. The original model was painted the Air Force Arctic coloring of silver with red wingtips and tail. The silver was made by mixing aluminum powder with clear hot fuel proofer and brushed on. This was leveled to a beautiful metallic finish. The red used was Testor's. Paint the black anti-glare on top of the cowling and then add the wind shield.

The wing (*Continued on page 48*)



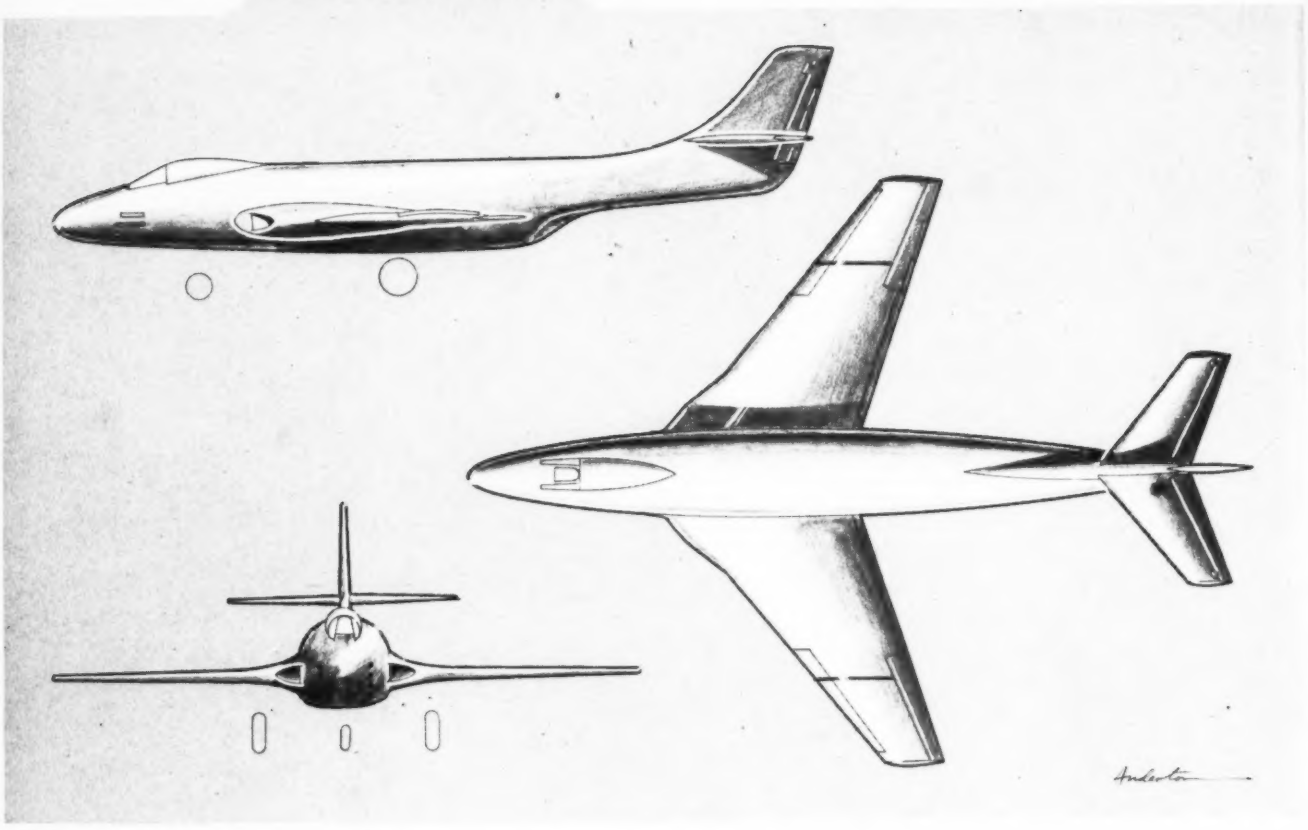


THE BEAVER

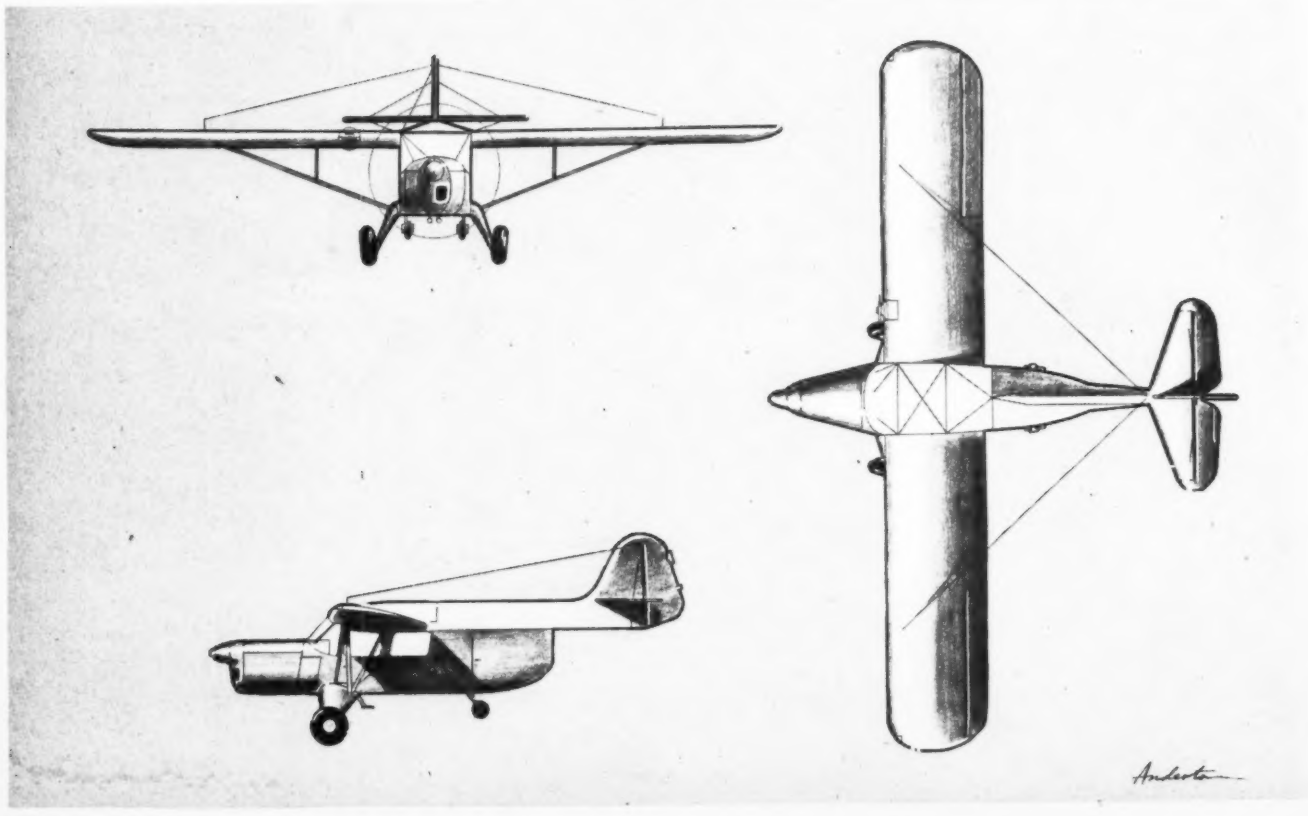
This plane is considered one of the world's finest light transport designs.

FULL-SIZE PLANS FOR BOTH "THE BEAVER" AND "THE ZENITH" AVAILABLE. SEE PAGE 54.

No. 21—McDonnell F-88A



No. 22—Auster B.4



PLANES IN THE NEWS

by DAVID ANDERTON

Built-in tankage of 1,400 gallons gives Voodoo range of 1,725 miles. Tiptanks may be added for in-air refueling. Span is 15 feet less than length.

▸ Unless the Air Force changes its mind again, the McDonnell *F-88 Voodoo* is going into production. And it's not to be limited production, but a full-scale effort. The reason: AF will take advantage of the long-range characteristics of the *F-88* by having the *Voodoo* act as escort fighter to Strategic Air Command bombers.

So the *Voodoo* is going to be an important airplane. It's going to be hanging around the sky when the big boys go in with their bomb bays full; it's going to give them cover during the long "straight-and-level" run between initial point and drop point; and it's going to be on the edges of the bomber box on the way home.

But it's got more than range. Top speed of the craft is reported as "over 700 mph." Armament consists of a sextet of 20-mm. cannon and fittings for bombs and rockets under the wings. It's a tough baby.

Let's have a close-up look at the *Voodoo*. The three-view shows it to be of rather conventional appearance with some angularity of line and a slightly awkward aspect at the exit of the jet exhausts. The pilot sits high and well forward so that his all-around visibility should be excellent.

Perhaps the single characteristic which draws your eye is the shape of the *Voodoo* wing. It differs from the usual sweptwing layout in which tip and root chord are nearly the same. In the *Voodoo*, the wing planform taper ratio is nearly four to one. Sweepback is the usual value of 35 degrees.

Span of the *F-88* is 39 ft. 8 in.; its length is 54 ft. 1.4 in. The plane stands 17 ft. 3.2 in. high to the tip of the vertical fin. Gross weight is not available, but is quoted officially as "over 20,000 lb." Engines are two Westinghouse *J-34-WE-22* at 3600 lb. thrust each.

Built-in tankage on the *Voodoo* holds 1400 gal.; this quantity of fuel gives the craft a range of 1725 miles. It is expected that the production version of the *Voodoo* will have wingtip auxiliary tanks and provision for in-flight refueling.

There's one annoying thing about the *F-88* program, and it's no fault of McDonnell's.

We could have had this escort fighter in production two years ago. We might even have had a few in Korea to meet the Red *MiG's* and better craft reported on occasion in *MiG* alley. And we certainly would have had the *Voodoo* much sooner than the current production program will deliver them.

What happened? Well, like so many other weapons, the *Voodoo* was hit in the head with that old economy axe. In the summer of 1949, the craft was scheduled for production. The economy edict fixed that order.

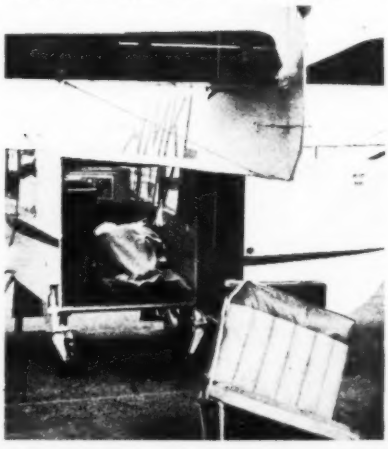
About one year later, the *F-88* went into an evaluation program with Lockheed's *F-90* and North American's *F-93* (as the *F-86C* was then called.). In June of 1950, the sky over Edwards AFB, Calif., was daily torn by the screaming passes and demonstration flights of these three sluggers.

Out of the program, the McDonnell craft emerged with the honors. And like many another prizewinner, the *Voodoo* sat back and waited for the prize—an order for 150 to 300 of the type. The order never came. The Air Force had changed its mind; it wanted fighter-bombers (Korean lessons of the moment were overshadowing any longer-range planning).

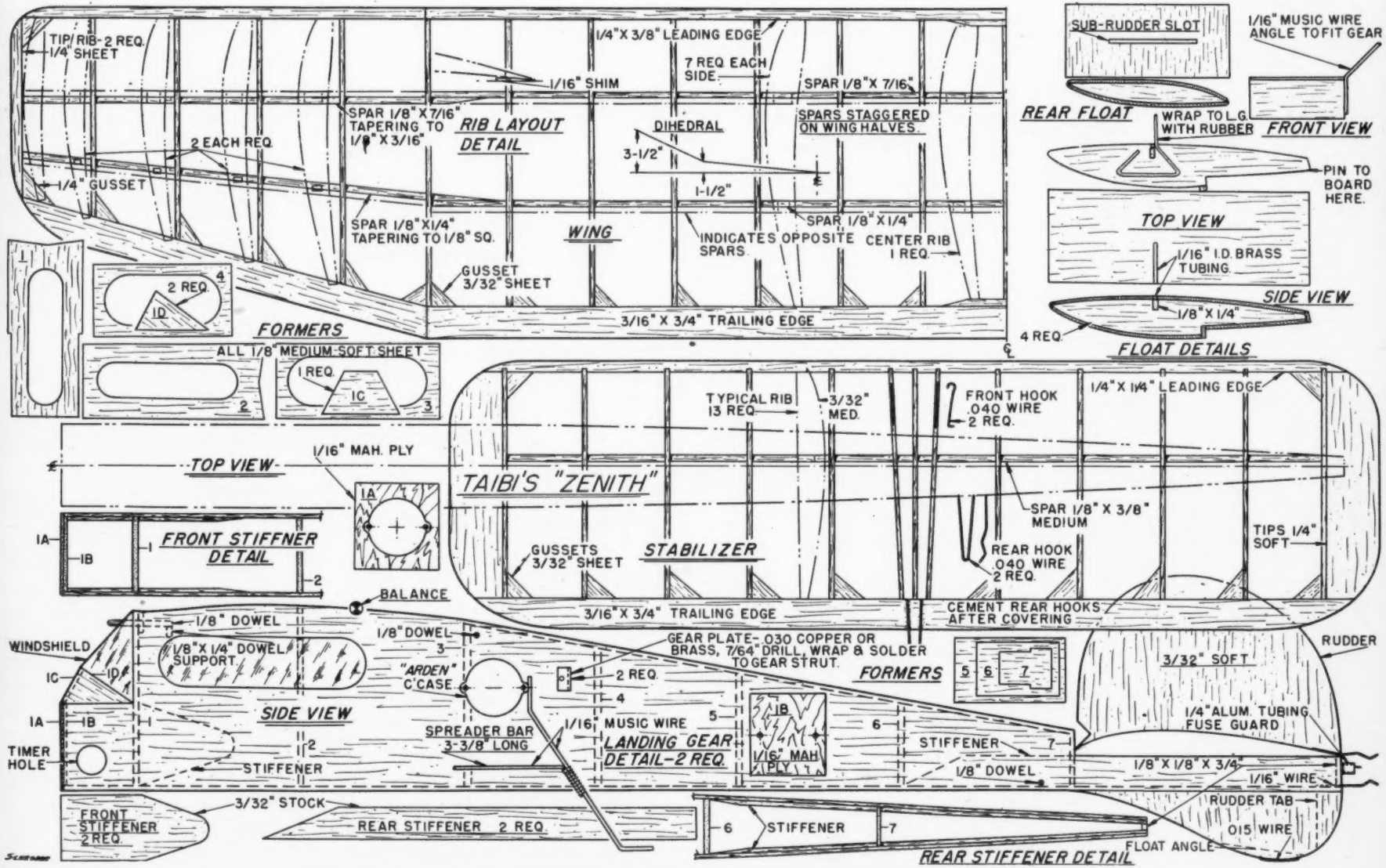
In the fall of that same year, the Army latched onto the *F-88* and made noises to the effect that the *Voodoo* was just the plane needed to provide ground support for troops. The Army wanted some; and when the Air Force was toying with the idea of giving McDonnell an order for a turboprop version, the Army screams were louder.

But the Air Force changed its mind again, and finally gave the turboprop program to (*Continued on page* 48)

Seats interchangeable for five, for freight.



Does this on 180 hp Cirrus *Bombardier* engine. Small-fry flying box car, Auster ambulance.



FULL-SIZE PLANS FOR BOTH "THE BEAVER" AND "THE ZENITH" AVAILABLE. SEE PAGE 54.

THE ZENITH

by SAL TAIBI

The old free flight master turns out a ship that won a second in ROW, first Class A in Dallas Nats. Takes .09 displacement engines.

Sal, Modelcraft Trophy. Ship also won San Dimas all-classes ROW.

▸ The *Zenith* represents my first successful free flight design since leaving Indiana and moving to the Utopia of model flying, the land of balmy breezes and round the year flying, Southern California.

I had long been impressed by the large size of the free flight models flown on the West Coast, and along with some additional personal experience gained before I left Indiana, I've come to the conclusion that the size of the airplane did not determine the angle and rapidity of climb as much as the total weight of the model. I figured that if a model could be kept light in weight it could climb right along with the smaller model and, properly adjusted, could certainly outglide it. The light wing loading of the *Zenith*, approx. four ounces per square foot gives the model a beautiful floating glide with excellent tendencies to pick up thermals low to the ground.

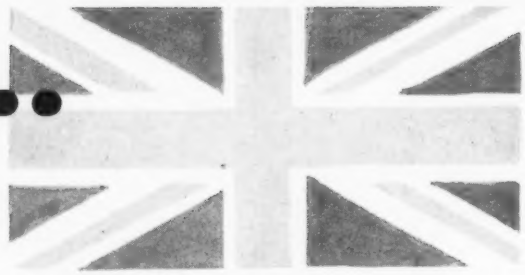
The design experimentation began with an AA model. All rudder and airfoil changes were made on this model and when it seemed that the airplane could take all the power available with no bad power characteristics and could fly well in a high wind, the plans were scaled up to suit the Arden *.099*. You can substitute any appropriate .09.

The effort was well rewarded when I took the *Zenith* to contests. On July. 8, 1951 the *Zenith* being flown in an all-classes-combined, R.O.W. meet at San Dimas, Calif. placed first with a total of 12:41 on a very cloudy, overcast day. Two weeks later at the Nationals at Dallas, Texas it placed second in R.O.W. and the following day the *Zenith* made a total of 27:44 to win first place in class "A".

Obtain the full-size drawing, then study the plans and familiarize yourself with the construction. It is very important that the wood be of fairly light stock, quarter grained if possible. This will (*Continued on page* 44)

air ways...

Alan Hewitt's stunt winner, an Elfin 2.49 diesel, had 225 sq. in. Was fast.



AT THE BRITISH NATIONALS

An eye-witness account of the various events, the types of models flown.

▶ The 1951 British Nationals were held at Swansea in South Wales—200 miles west of London—and were the fifth since the inaugural contest in '47. This year's Nats consisted of FAI rubber and glider, free flight (open), R/C, speed (seven classes) and open stunt. Entries totalled over 400 from 13 of the 16 areas into which the country is divided by the SMAE (the British AMA).

Brian Hewitt of Birmingham, who won the stunt at the '49 and '50 Nats, was nudged into second place this year by his younger (*Continued on page* 45)

S/Ldr. Eric Cable and radio control pusher. Motor is ball-bearing Amco 3.5 diesel. Note how tail mounts on a pylon held on fuselage by rubber bands.

Iorwerth Jones with *Chief* glider, an A2 type that also holds New Zealand record and won its event in S. African Nats.

Left—Popular *Thunderking* glider gets away on launch. Models of this size were not uncommon at the 1951 British Nats.

The Class 3 speed winner at 95.16 mph, team of Dick Taylor and Mike Billington. McCoy .19 powered original design. Weight was 9½ ounces. This flight was claimed as a new British record.

Brian Hewitt, second to brother in stunt, flew Yulon *30* glo job. Brian won 1949, 1950 Nats.

G. S. Munroe with his five-foot *Nordic* A2 glider. Typical of many such jobs flown at this years Nats, features pop-up stab atop vertical fin.

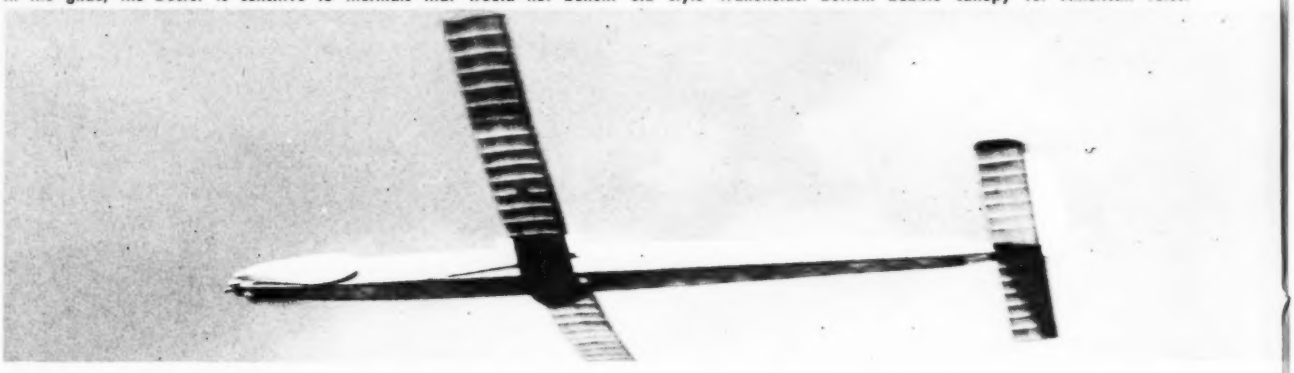
Winning free flight put up two five-minute maximum flights. Elfin 2.49 diesel, 400 sq. in. wing, 135 sq. in. stab, and a weight of 16½ ounces.

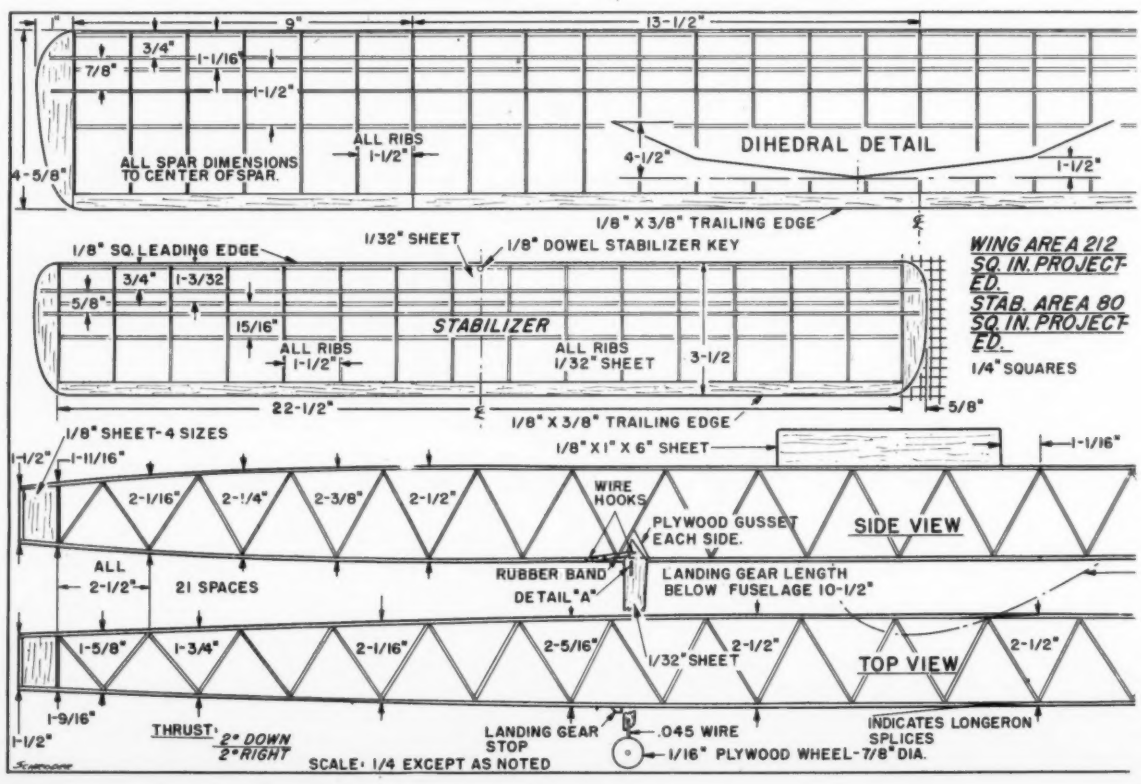
Typical stunt entry by A. V. Coles, Frog *500* glow plug motor. Wing had 350 sq. in. area. Weight was 24 ounces, indicating rather light weights.

Mike Billington starting his Class 6 speed entry. Using McCoy *60* series 20 he hit 128.29. Span 24 in., weight 32 ounces, and area 72 sq. in.

THE DUSTER

Joe Bilgri, left, uses heavy duty winder to pack in the turns. Light construction is essential, even to use of Jap tissue for covering. In the glide, the *Duster* is sensitive to thermals that would not benefit old style Wakefields. Bottom bubble canopy for American rules.





The *Duster* represents a new type of Wakefield model that has in a few months proved to be no novelty and more than capable of winning its share of contests as it did in the Wakefield event at the 1951 Nationals. This model has most everything a good Wakefield should have in either dead air flying or any type of thermals; it has a high climb with a very flat glide and will ride thermals so weak that you never knew were around, flying a shorter type of Wakefield. At Dallas it made five-minute flights in both the wind and at 6:30 in the evening when the weather was fairly calm.

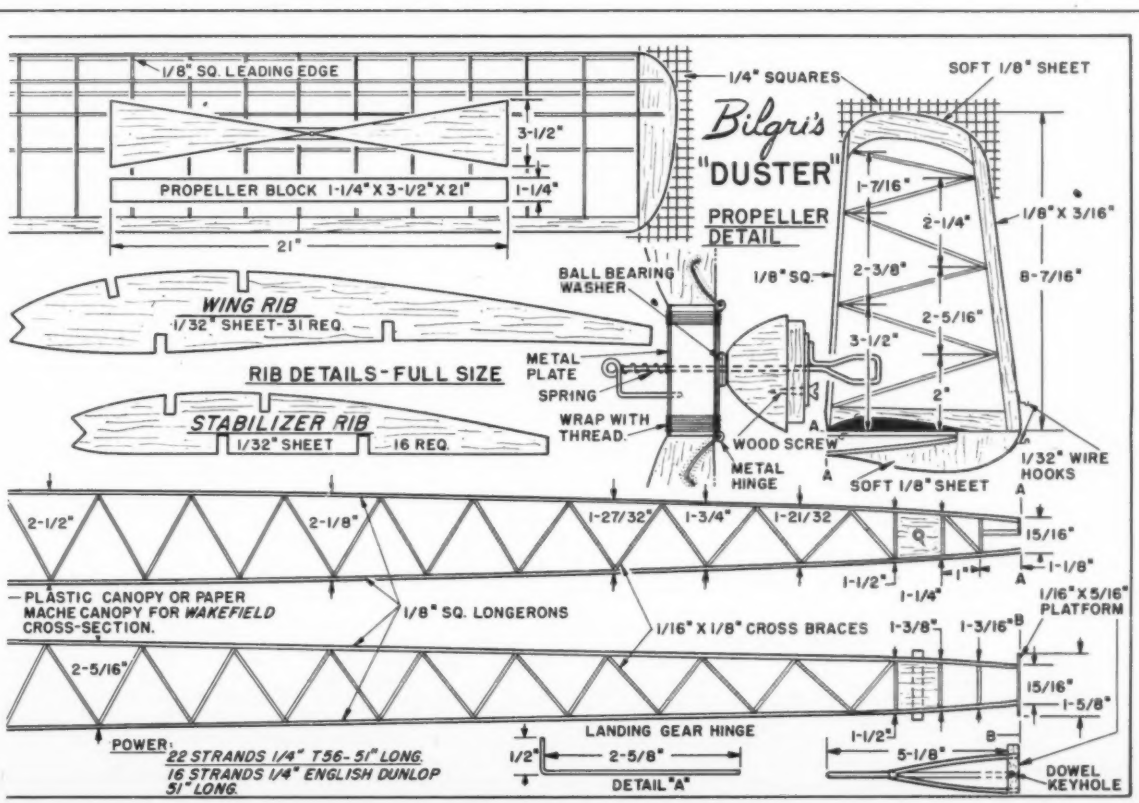
Due to its length the fuselage is built using the Warren Truss type of construction which will not allow the fuselage to twist even after the covering is torn or has loosened up from age or rubber lubricant. For those who haven't built this type of fuselage before, one side is built exactly like the plans but the other side is built with the diagonals running the opposite way or, when one side is built on top of the other, X's are formed. The four main longerons should be selected from medium hard 1/8 square balsa of equal weight and straightness of grain. As five-foot lengths are almost impossible to obtain they are spliced together from three-foot lengths. The cross braces should be light 1/16 x 1/8" balsa, and if none is obtainable, should be stripped from light 1/16" sheet. Be sure to cement in the plywood landing gear gussets on each side of the fuselage before covering, for the landing gear is installed after the fuselage has been covered and doped. The wing platform pieces should not be cemented on until the entire model has been covered and doped, as will be explained later.

The main landing gear strut is built up and weighs approximately half the weight of a wire one, while still having more than enough strength to support the model. The inner part is cut from hard 3/32" sheet and tapers from 3/16" at the top to 3/32" at the bottom. On each side of this is cemented 1/32" sheet (*Continued on page* 50)

by JOE BILGRI

This 1951 Dallas Nationals winner is an outstanding example of the long fuselage trend in Wakefields. It made five-minute flights in both wind and calm in Texas!

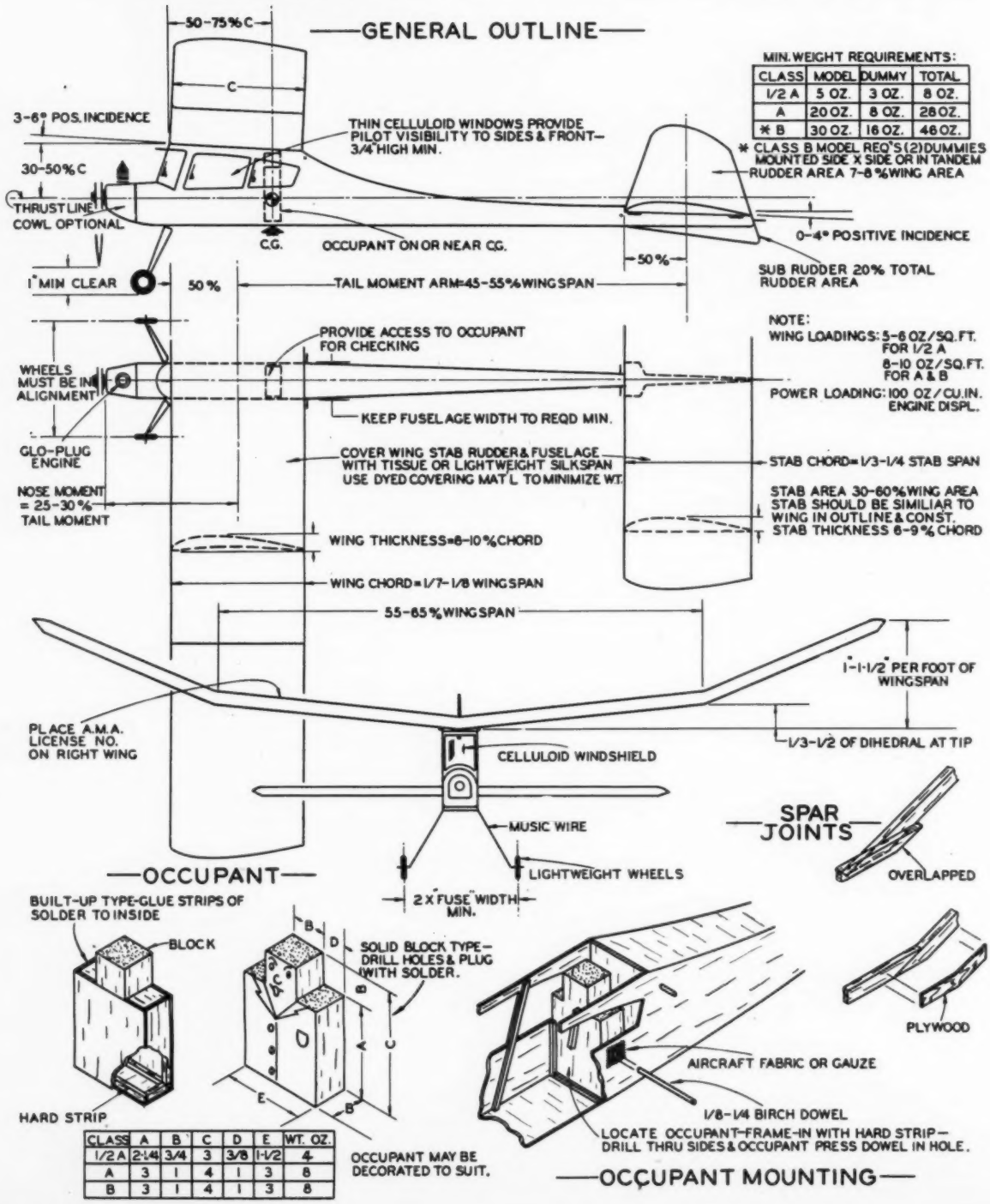
One action shot not made by use of thread! Motor: 22 strand, 52 inches.



design detail . . . by Harry Williamson

Payload

Though most of us build from kits and magazine plans everyone takes an occasional fling at an "original." This series will keep you on the ball.


GENERAL OUTLINE
50-75% C
C
3-6° POS. INCIDENCE
30-50% C
THRUST LINE COWL OPTIONAL
1" MIN CLEAR
C.G.
THIN CELLULOID WINDOWS PROVIDE PILOT VISIBILITY TO SIDES & FRONT— 3/4" HIGH MIN.
OCCUPANT ON OR NEAR CG.
50%
TAIL MOMENT ARM=45-55% WING SPAN
0-4° POSITIVE INCIDENCE
SUB RUDDER 20% TOTAL RUDDER AREA
MIN. WEIGHT REQUIREMENTS:
CLASS | MODEL | DUMMY | TOTAL
1/2 A | 5 OZ. | 3 OZ. | 8 OZ.
A | 20 OZ. | 8 OZ. | 28 OZ.
* B | 30 OZ. | 16 OZ. | 46 OZ.
* CLASS B MODEL REQ'S (2) DUMMIES MOUNTED SIDE X SIDE OR IN TANDEM
RUDDER AREA 7-8 % WING AREA
NOTE:
WING LOADINGS: 5-6 OZ/SQ. FT. FOR 1/2 A
8-10 OZ/SQ. FT. FOR A & B
POWER LOADING: 100 OZ/CU. IN. ENGINE DISPL.
PROVIDE ACCESS TO OCCUPANT FOR CHECKING
WHEELS MUST BE IN ALIGNMENT
GLO-PLUG ENGINE
NOSE MOMENT = 25-30 % TAIL MOMENT
KEEP FUSELAGE WIDTH TO REQD MIN.
COVER WING STAB RUDDER & FUSELAGE WITH TISSUE OR LIGHTWEIGHT SILKSPAN USE DYED COVERING MAT'L TO MINIMIZE WT.
STAB CHORD= 1/3-1/4 STAB SPAN
STAB AREA 30-60% WING AREA
STAB SHOULD BE SIMILIAR TO WING IN OUTLINE & CONST.
STAB THICKNESS 8-9% CHORD
WING THICKNESS=8-10% CHORD
WING CHORD= 1/7-1/8 WING SPAN
55-65% WING SPAN
1"-1-1/2" PER FOOT OF WINGSPAN
PLACE A.M.A. LICENSE NO. ON RIGHT WING
CELLULOID WINDSHIELD
1/3-1/2 OF DIHEDRAL AT TIP
MUSIC WIRE
LIGHTWEIGHT WHEELS
2 X FUSE WIDTH MIN.
SPAR JOINTS
OVERLAPPED
OCCUPANT
BUILT-UP TYPE-GLUE STRIPS OF SOLDER TO INSIDE
BLOCK
HARD STRIP
SOLID BLOCK TYPE— DRILL HOLES & PLUG WITH SOLDER.
OCCUPANT MAY BE DECORATED TO SUIT.
CLASS | A | B | C | D | E | WT. OZ.
1/2 A | 2-1/4 | 3/4 | 3 | 3/8 | 1-1/2 | 4
A | 3 | 1 | 4 | 1 | 3 | 8
B | 3 | 1 | 4 | 1 | 3 | 8
PLYWOOD
AIRCRAFT FABRIC OR GAUZE
1/8-1/4 BIRCH DOWEL
LOCATE OCCUPANT-FRAME-IN WITH HARD STRIP— DRILL THRU SIDES & OCCUPANT PRESS DOWEL IN HOLE.
OCCUPANT MOUNTING

—WING TYPES—

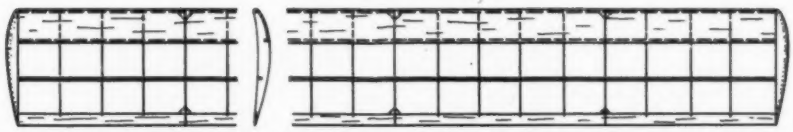


FIG.1. DOUBLE SPAR-LE.SHEETED ON TOP ONLY-FLAT OR UNDERCAMBERED SECTIONS. STRONG, LIGHT & EASILY BUILT-WARP RESISTANT-AERODYNAMICALLY EXCELLENT-FOR 1/2A A&B.

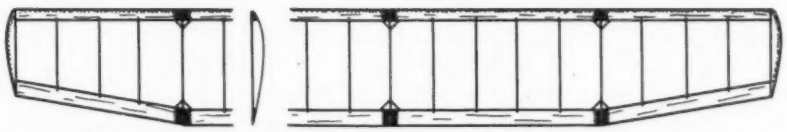


FIG.2. SPARLESS-HEAVY LEADING & TRAILING EDGES-BEST WITH THIN, FLAT SECTIONS-WARP RESISTANT-EASILY REPAIRED-VERY LIGHT-NOT AS STRONG OR EFFICIENT AS FIGS.1,3 & 4-VERY EASILY BUILT-FOR 1/2A.

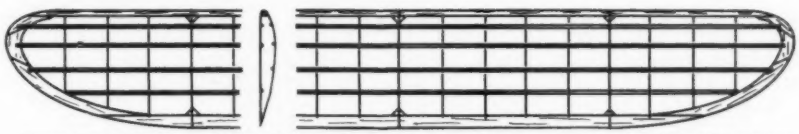


FIG.3. MULTI-SPAR-3 OR MORE LIGHTWEIGHT SPARS TOP & BOTTOM-FLAT OR UNDERCAMBERED SECTIONS-STRONG & LIGHT-MORE DIFFICULT TO BUILD THAN FIGS. 1,2 & 4-WARP RESISTANT-AERODYNAMICALLY GOOD-FOR 1/2A A&B.

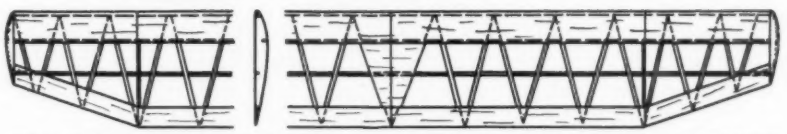


FIG.4. DOUBLE SPAR-SEMI-GEODETIC-HEAVY LEADING EDGE-SHEET COVERED TRAILING EDGE RIBS CAP STRIPPED TOP & BOTTOM-VERY STRONG & LIGHT-EASY TO CONSTRUCT-EXCELLENT WARP RESISTANCE-BEST SUITED FOR FLAT SECTIONS-VERY EFFICIENT-FOR A&B.

—FUSELAGES—

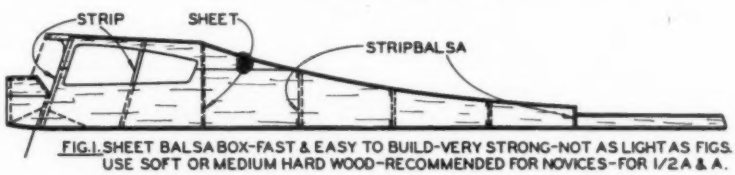


FIG.1. SHEET BALSA BOX-FAST & EASY TO BUILD-VERY STRONG-NOT AS LIGHT AS FIGS. 2 & 3-USE SOFT OR MEDIUM HARD WOOD-RECOMMENDED FOR NOVICES-FOR 1/2A & A.

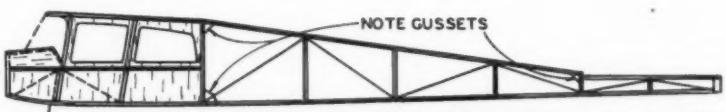


FIG.2. BUILT-UP BOX-HARD BALSA LONGERONS & UPRIGHTS-SMALLER DIAGONALS-FILL-IN FROM NOSE TO CABIN REAR WITH SOFT SHEET-STRONG & LIGHT-FOR A&B.

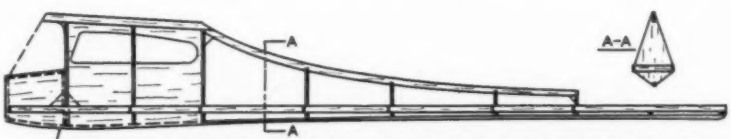


FIG.3. CRUTCH & FORMER-HORIZONTAL CRUTCH HARD BALSA STRIP-SHEET OR STRIP FORMERS-FILL-IN CABIN WITH SOFT SHEET-LOW DRAG-LIGHT-STRONG-1/2A, A&B.

—WING TIPS—

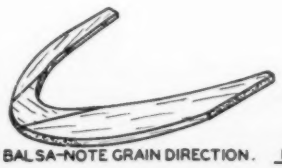


FIG.1. SHEET BALSA-NOTE GRAIN DIRECTION.

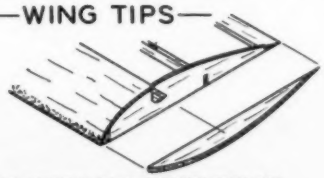


FIG.2. SHEET BALSA-CUT TO RIB OUTLINE.

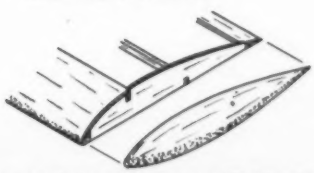


FIG.3. SOFT BALSA BLOCK-MAY BE HOLLOWED.

—RUDDERS—

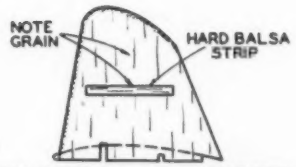


FIG.1. SHEET BALSA-THIN SYMMETRICAL AIRFOIL-MAY BE INSERTED BETWEEN STAB RIBS FOR STRENGTH-EASILY BUILT-STRONG-FOR 1/2A&A.

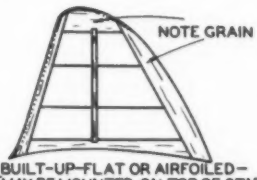
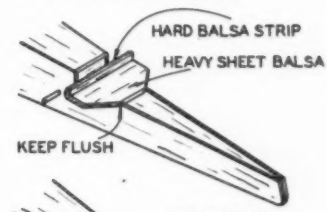
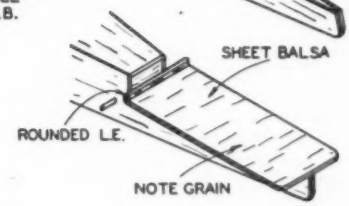


FIG.2. BUILT-UP-FLAT OR AIRFOILED-MAY BE MOUNTED ON TOP OF STAB OR INSERTED AS IN FIG.1-MORE DIFFICULT TO BUILD-LIGHT-STRONG-FOR 1/2A, A&B.

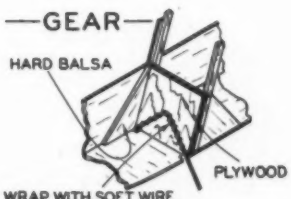
—STAB RESTS—





—FIREWALL—

—GEAR—



official news

by RUSS NICHOLS and CARL WHEELEY

FCC Moves Toward Simplified Regulations • PAA Rules Changed • PAA Records To Be Recognized • New FAI and National Records

▸ FLASH! Walt Good, AMA Radio Control Committee Chairman, announces the release of Docket 10086 by the Federal Communications Commission on November 15, 1951. This docket is a notice of proposed F.C.C. rule changes which, if adopted, would give simplified provisions for the radio control of models. The F.C.C. has set the deadline of January 11, 1952, for submission of all written comments on the proposal. Hearings will be held if required by the comments, when the rules up for modification are ready to be adopted as full-fledged rules by the Commissioners. In other words, the quickness of adoption depends on whether the comments received by F.C.C. create controversy or modification of the proposals. We're not there yet but we're getting close.

What does the proposal provide for the RC modeler?

A. A modeler may build or buy his transmitter if he conforms to the following items: 1. The transmitter must be crystal controlled at a frequency of 27.255 mc.; 2. The transmitter must not exceed five watts imput power; 3. The owner of the transmitter must file F.C.C. Form 505 with his nearest F.C.C. office. Approval of this form constitutes the license of the transmitter.

B. No operator's license is required. Anyone may operate the transmitter with the owner's permission.

C. This service may use only on-off unmodulated or amplitude tone modulated carrier for the remote control of objects or devices only—no voice or morse code communication allowed. Says Walt, "Remember, this is not yet a rule. It's a rule proposal. For more details, refer to F.C.C. Docket 10086."

WORLD RECORD HOLDER GIVEN TO NATIONAL AIR MUSEUM. The model airplane with which Eugene Stiles of Alameda, Calif., ended Russia's monopoly of the world record holding scene in 1949, and brought a world's record to the United States for the first time, was presented to the National Air Museum, Washington, D. C., on November 14th and accepted by Paul Garber, curator.

The presentation was made by R. C. Somerville, general sales manager of Plymouth Motor Corporation, who at the same time announced that Plymouth would again this summer sponsor F.A.I. world record trials at the Internationals.

The 30-ounce model which Somerville turned over to the National Air Museum ended the world record drought for American modelers on July 20, 1949, when Stiles flew it at the Naval Air Station, Alameda, Calif., at 80.634 mph over a straight-line, 100 meter course. It broke the old straight-line record which had been held by Vladimir Davidov, by 14.098 mph.

Stiles' model, Garber announced, will be exhibited in famous company at the National Air Museum: the Wright Brothers' *Kitty Hawk*, first powered and controlled heavier-than-air craft to carry man (1903); the *Spirit of St. Louis;* the *Winnie Mae;* the supersonic Bell *X-1*, first to fly faster than the speed of sound. It will be placed near three full-scale planes, famous in history as "firsts": the *NC-4*, first to fly the Atlantic (1919); the *T2*, first to fly this continent non-stop (1923) and the Douglas *World Cruiser*, first to fly around the world (1924).

"Since the only two world's records brought to this country have been established at (*Continued on page* 53)

Gene Wallock holds rubber model for Jack Block. Note how hand protects nose while other hand grasps ends of the dowl rubber anchor.

Russ Johnson winds for Andy Petersen. Note that a wire hook is not used in the chuck, also the bobbin to prevent bunching of knots.

During the twenties Curtiss turned their war-learned experience toward the design of a cabin plane to replace the drafty, open cockpit biplane. This is the untold story.

CURTISS ROBIN

by ROBERT C. HARE

March, 1928 witnessed the introduction of one of the most significant airplanes of the 1920's. It was the *Curtiss Robin*, a three-place cabin monoplane. Although not an unusual aircraft in the sense of an outstanding advance in the science, it did represent a trend that was to set a pace which hastened the coming of the "modern" airplane.

To appreciate the *Robin* fully, it must be remembered that the predominant configuration of airplanes of the 1920's was that of the biplane. Generally these were three-place craft, powered by engines up to 200 hp, but principally 90 hp because of the easy availability of the Curtiss *OX-5* World War I surplus engines. These biplanes were actually little improved over their W.W.I. inspirations. Better constructed and more soundly engineered, perhaps, but little improved.

Only the most skillful or the most foolhardy pilots flew these biplanes in anything but contact weather. They were meagerly instrumented, and their open cockpits were cold, windy, and offered little protection against the elements. Moreover, their range limited them to relatively short hops, such as training flights or sight-seeing hops.

These low-powered biplanes had three virtues, however. They were economical to operate, they had a fair cruising speed, and they landed slowly. Most cabin monoplanes of the '20's were beyond the reach, pricewise, of the flying enthusiast, which limited their numbers.

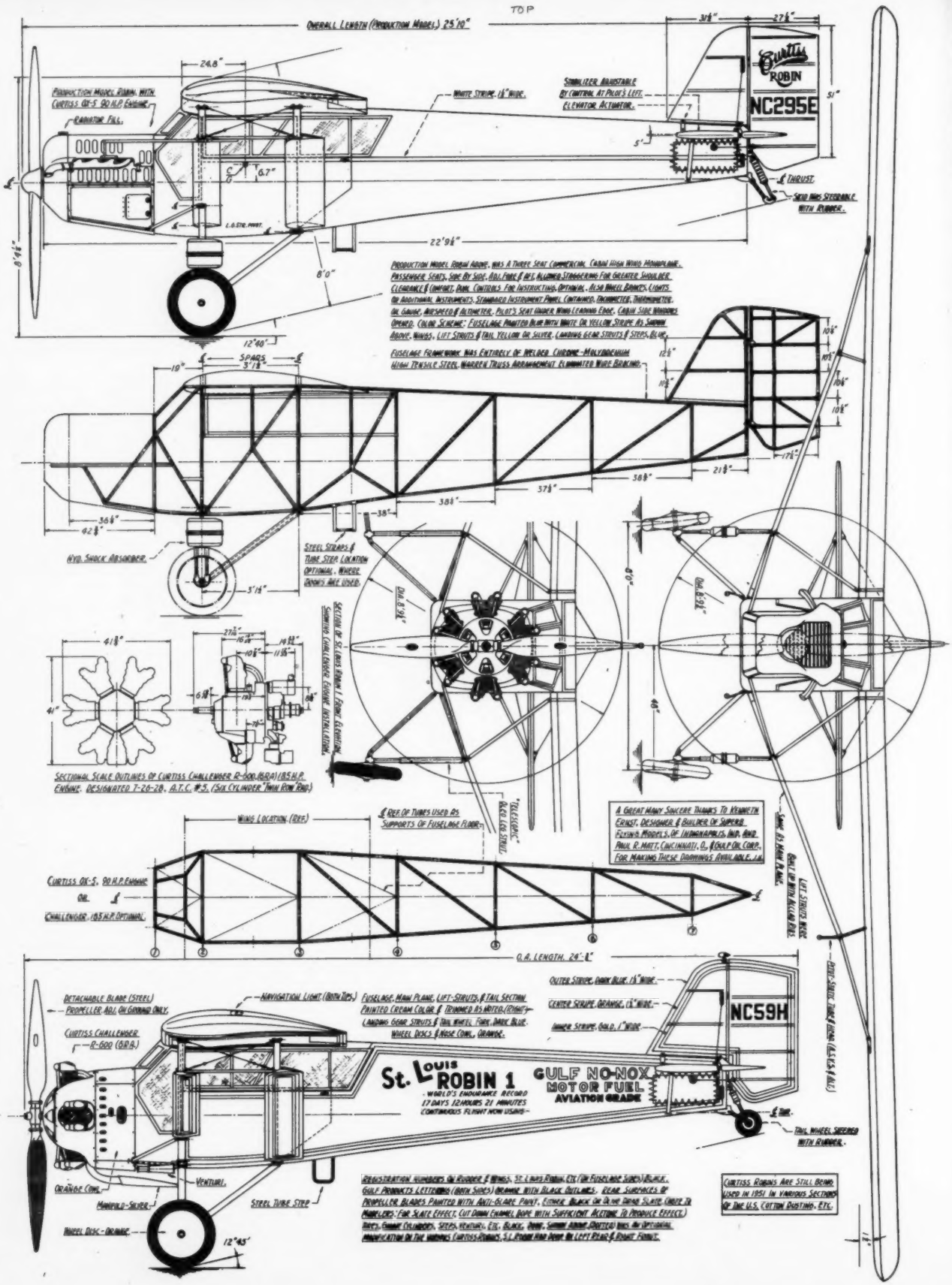
Curtiss named its aircraft after birds. Among the most famous of the 1920's were the *Curtiss Hawk* pursuit, the *Falcon* observation plane, and the *Condor* bomber. Among commercial craft of the same period were the *Oriole*, an immediate post—W.W.I. product, the *Lark* and the *Carrier Pigeon*. All were biplanes of conventional design, constructed in small quantities. Curtiss, the great builder of military aircraft, was feeling its way into the civil aviation field. The background of experience the firm gained was invaluable.

The fact was evident in the development of the *Robin*. As a monoplane, it was a distinct departure from previous Curtiss practice, and the cabin feature was an innovation. Perhaps most outstanding were some of the engineering features leading up to the design and finally incorporated in it.

The object in mind, when the *Robin* was designed, was to produce an inexpensive airplane in the same general weight and power class as the numerous biplanes of the period, featuring the comfort of an enclosed cabin and the simplicity of the monoplane. The plane was designed at the Curtiss Aeroplane and Motor Company, Inc., plant at Garden City, L. I., by an engineering group composed of men who had designed and engineered the well known Curtiss *Hawk* pursuits.

The *Robin* probably was the most completely engineered private plane of its day. The Curtiss laboratories' full facilities were used to test each (*Continued on page* 42)

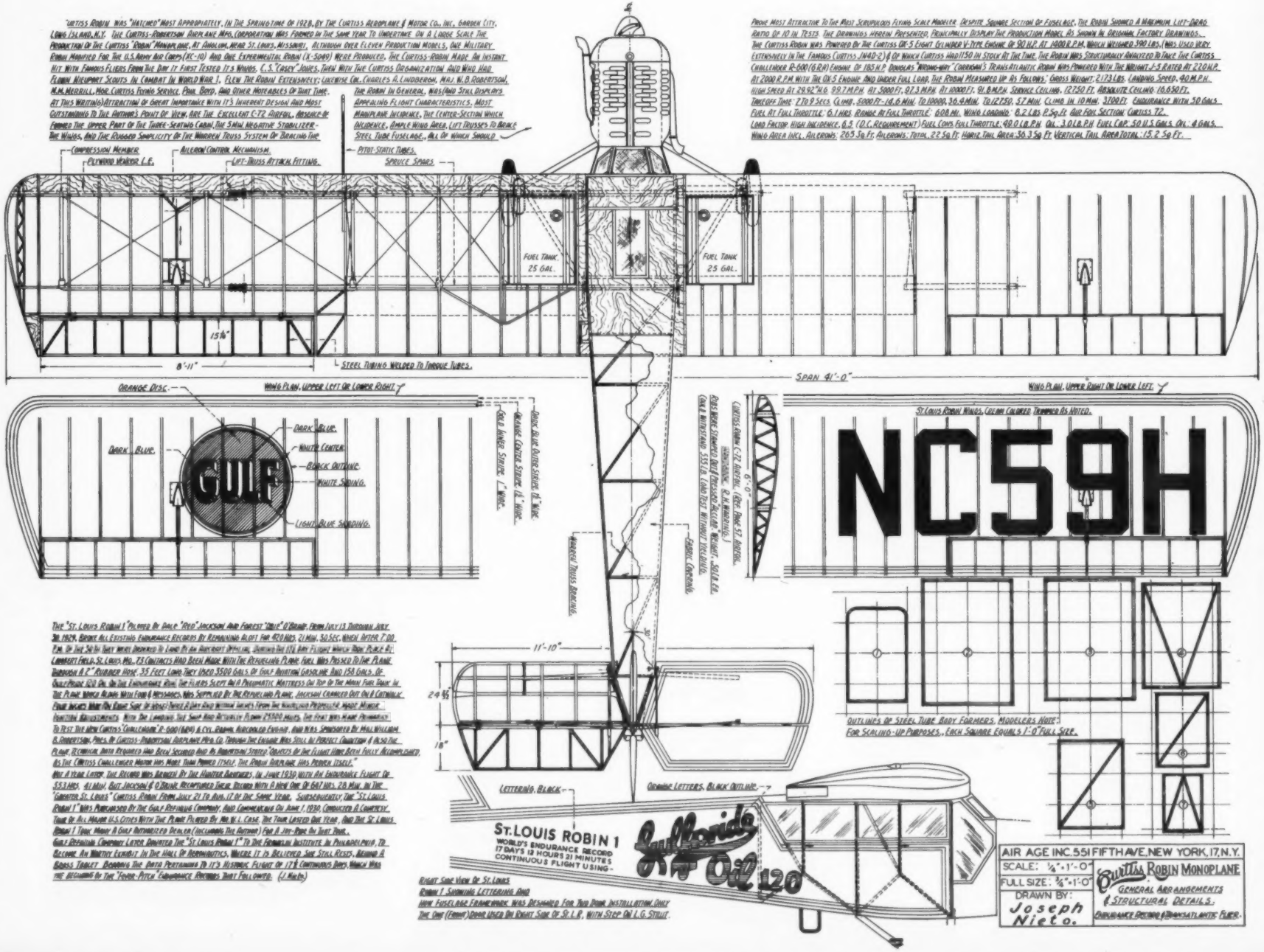
Top—The *Challenger*-powered *Robin*. Below—The original *Robin* design which took advantage of a large supply of Curtiss OX-5 engines then on hand.


TOP
OVERALL LENGTH (PRODUCTION MODEL) 25'10"
PRODUCTION MODEL ROBIN WITH CURTISS OX-5 90 H.P. ENGINE
RADIATOR FILL.
WHITE STRIPE, 15" WIDE.
STABILIZER ADJUSTABLE BY CONTROL AT PILOT'S LEFT. ELEVATOR ACTUATOR.
Curtiss ROBIN
NC295E
℄ THRUST.
SKID HAS STEERANCE WITH RUBBER.
PRODUCTION MODEL ROBIN ABOVE, WAS A THREE SEAT COMMERCIAL CABIN HIGH WING MONOPLANE. PASSENGER SEATS, SIDE BY SIDE. ADJ. FORE & AFT. ALLOWS STAGGERING FOR GREATER SHOULDER CLEARANCE & COMFORT. DUAL CONTROLS FOR INSTRUCTING, OPTIONAL. ALSO WHEEL BRAKES, LIGHTS OR ADDITIONAL INSTRUMENTS. STANDARD INSTRUMENT PANEL CONTAINED, TACHOMETER, THERMOMETER, OIL GAUGE, AIRSPEED & ALTIMETER. PILOT'S SEAT UNDER WING LEADING EDGE. CABIN SIDE WINDOWS OPENED. COLOR SCHEME: FUSELAGE PAINTED BLUE WITH WHITE OR YELLOW STRIPE AS SHOWN ABOVE. WINGS, LIFT STRUTS & TAIL YELLOW OR SILVER. LANDING GEAR STRUTS & STEPS, BLUE.
FUSELAGE FRAMEWORK WAS ENTIRELY OF WELDED CHROME-MOLYBDENUM HIGH TENSILE STEEL. WARREN TRUSS ARRANGEMENT ELIMINATED WIRE BRACING.
5 PANELS
HYD. SHOCK ABSORBER
STEEL STRAPS & TUBE STEP LOCATION OPTIONAL. WHERE DOORS ARE USED.
SECTION OF ST. LOUIS ROBIN 1 FRONT ELEVATION, SHOWING CHALLENGER ENGINE INSTALLATION.
DIA. 8'6½"
DIA. 8'6½"
SECTIONAL SCALE OUTLINES OF CURTISS CHALLENGER R-600 (6BA) (185 H.P. ENGINE. DESIGNATED T-20-28, A.T.C. #5. (SIX CYLINDER "INLINE ROW ENG.)
WING LOCATION (REF.)
℄ REF. OF TUBES USED AS SUPPORTS OF FUSELAGE FLOOR
"FUSELAGE" BOTTOM STRIP.
CURTISS OX-5, 90 H.P. ENGINE OR ℄ CHALLENGER, 185 H.P. OPTIONAL
A GREAT MANY SINCERE THANKS TO KENNETH ERNST, DESIGNER & BUILDER OF SUPERB FLYING MODELS, OF INDIANAPOLIS, IND. AND PAUL R. MATT, CINCINNATI, O. & GULF OIL CORP. FOR MAKING THESE DRAWINGS AVAILABLE, J.A.
SAME AS MAIN PANEL
BOLT UP WITH ALLOW BOLTS
LIFT STRUTS MADE OF STEEL TUBING (STREAMLINED)
O.A. LENGTH, 24'-1"
DETACHABLE BLADE (STEEL) PROPELLER ADJ. ON GROUND ONLY.
CURTISS CHALLENGER R-600 (6BA)
NAVIGATION LIGHT (BOTH TIPS.)
FUSELAGE, MAIN PLANE, LIFT-STRUTS, & TAIL SECTION PAINTED CREAM COLOR & TRIMMED AS NOTED (RIGHT)
LANDING GEAR STRUTS & TAIL WHEEL FORK, DARK BLUE. WHEEL DISCS & NOSE COWL, ORANGE.
OUTER STRIPE, DARK BLUE, 15" WIDE.
CENTER STRIPE, ORANGE, 12" WIDE.
INNER STRIPE, GOLD, 1" WIDE.
NC59H
St. Louis ROBIN 1
WORLD'S ENDURANCE RECORD 17 DAYS 12 HOURS 21 MINUTES CONTINUOUS FLIGHT NOW USING
GULF NO-NOX MOTOR FUEL AVIATION GRADE
℄ TOW.
TAIL WHEEL STEERED WITH RUBBER.
ORANGE COWL
MANIFOLD-SILVER
WHEEL DISC-ORANGE
VENTURI.
STEEL TUBE STEP
12"45"
REGISTRATION NUMBERS ON RUDDER & WINGS, ST. LOUIS ROBIN, ETC (ON FUSELAGE SIDES) BLACK. GULF PRODUCTS LETTERING (BOTH SIDES) ORANGE WITH BLACK OUTLINES. REAR SURFACES OF PROPELLER BLADES PAINTED WITH ANTI-GLARE PAINT. EITHER BLACK OR OLIVE DRAB SLATE GREY TO MARKERS. FOR SLATE EFFECT, CUT DOWN ENAMEL DOPE WITH SUFFICIENT ACETONE TO PRODUCE EFFECT.
INSTS. ENGINE CYLINDERS, STEPS, VENTURI, ETC. BLACK. PROP. SHOWN ABOVE (DOTTED) DOES AN OPTIONAL MODIFICATION ON THE MODELS CURTISS-ROBINS. ST. ROBIN HAD DOOR ON LEFT REAR & RIGHT FRONT.
CURTISS ROBINS ARE STILL BEING USED IN 1951 IN VARIOUS SECTIONS OF THE U.S. CROP DUSTING, ETC.

"Curtiss Robin" was "hatched" most appropriately, in the Springtime of 1928, by the Curtiss Aeroplane & Motor Co., Inc., Garden City, Long Island, N.Y. The Curtiss-Robertson Aircraft Mfg. Corporation was formed in the same year to undertake on a large scale the production of the Curtiss "Robin" monoplane, at Lambert Field, St. Louis, Missouri. Although over eleven production models, one military Robin modified for the U.S. Army Air Corps (XC-10) and one experimental Robin (X-5049) were produced, the Curtiss-Robin made an instant hit with famous fliers from the day it first tested its wings. C.S. "Casey" Jones, then with the Curtiss Organization and who had flown Nieuport Scouts in combat in World War I, flew the Robin extensively; likewise Col. Charles A. Lindbergh, Maj. W.B. Robertson, M.M. Merrill, Mgr. Curtiss Flying Service, Paul Boyd, and other noteables of that time. At this writing) attraction of great importance with it's inherent design and most outstanding to the amateur's point of view, are the excellent C-72 airfoil, adopted & formed the upper part of the three-seat-wide cabin, the small negative stabilizer-the wings, and the rugged simplicity of the Warren truss system of bracing the

The Robin in general, was/and still displays appealing flight characteristics, most

Probe most attractive to the most scrupulous flying scale modeler. Despite square section of fuselage, the Robin showed a maximum lift-drag ratio of 10 in tests. The drawings herein presented, principally display the production model as shown in original factory drawings. The Curtiss Robin was powered by the Curtiss OX-5 Eight Cylinder V-type engine or 90 H.P. at 1400 R.P.M. which weighed 390 lbs. (was used very extensively in the famous Curtiss JN4D-2's) of which Curtiss had 1150 in stock at the time. The Robin was structurally analyzed to take the Curtiss Challenger R-600 (6 R.A) engine of 185 H.P. Douglas "Wrong-way" Corrigan's Transatlantic Robin was powered with the Wright J-5 rated at 220 H.P. at 2000 R.P.M. with the OX-5 engine and under full load, the Robin measured up as follows: Gross Weight: 2173 lbs. Landing Speed: 40 M.P.H. High Speed at 29.92" 416 99.7 M.P.H. at 5000 Ft; 97.3 M.P.H. at 10000 Ft; 91.8 M.P.H. Service Ceiling: 12750 Ft. Absolute Ceiling: 16,650 Ft. Time/Cpff Time: 7 to 9 Secs. Climb: 5000 Ft-14.6 Min. To 10000, 36.4 Min. To 12750, 57 Min. Climb in 10 Min: 3700 Ft. Endurance with 50 Gals Fuel at Full Throttle: 6.1 Hrs. Range at Full Throttle: 608 Mi. Wing Loading: 8.2 Lbs. P.Sq.Ft. Gap: Fin. Section: Curtiss 72. Load Factor, High Incidence, 6.3 (D.C. Requirement) Fuel Cons. Full Throttle: 48.0 U.S.P.H. Oil: 3.0 U.S.P.H. Fuel Cap: 50 U.S. Gals. Oil: 4 Gals. Wing Area Incl. Ailerons: 265 Sq. Ft; Ailerons: Total, 22 Sq. Ft. Horiz. Tail Area: 36.3 Sq. Ft. Vertical Tail Area Total: 15.2 Sq. Ft.



The "St. Louis Robin 1" piloted by Dale "Red" Jackson and Forest "Jake" O'Brine from July 13 through July 30, 1929, broke all existing endurance records by remaining aloft for 420 hrs. 21 min. 30 sec. when after 7:00 P.M. on that 30th day they were ordered to land by an aircraft inspector, claiming that it's duty flight which took place at Lambert Field, St. Louis, Mo. 73 contacts had been made with the refueling plane. Fuel was passed to the plane through a 2" rubber hose, 35 feet long. They used 3500 gals. of Gulf Aviation Gasoline and 150 gals. of Gulfpride 120 oil. On the endurance ride the fliers slept on a pneumatic mattress on top of the main fuel tank in the plane which along with food & messages, was supplied by the refueling plane. Jackson crawled out on a catwalk. Four inches wide on each side of wing, twice a day and without incident from the refueling propeller made minor position adjustments. With the longest the same had actually flown 27,500 miles. The first was made primarily to test the new Curtiss "Challenger" R-600 (6RA) 6 cyl. Radial, air-cooled engine, and was sponsored by Mal. William B. Robertson, Pres. of Curtiss-Robertson Airplane Mfg. Co. Through the engine was still in perfect condition & also the plane technical data required had been secured and an additional stated "objects of the flight have been fully accomplished." As the Curtiss Challenger motor has more than proved itself, the Robin airplane has proven itself."

One year later, the record was broken by the Hunter Brothers, in June 1930 with an endurable flight of 553 hrs. 41 min. But Jackson & O'Brine recaptured their record with a new one of 647 hrs. 28 min. in the "Greater St. Louis" Curtiss Robin from July 21 to Aug. 17 of the same year. Subsequently, the "St. Louis Robin 1" was purchased by the Gulf Refining Company, and commencing on June 1, 1930, completed a courtesy tour of all major U.S. cities with the plane piloted by Mr. W.L. Case. The tour lasted one year, and the "St. Louis Robin 1" took many a gulf authorized dealer (including the author) for a joy-ride on that tour. Gulf Refining Company later donated the "St. Louis Robin 1" to the Franklin Institute in Philadelphia, to become an worthy exhibit in the Hall of Aeronautics, where it is believed she still rests, behind a glass tablet, bearing the data pertaining to it's historic flight of 17 & continuous days, which was the beginning of the "Four-Pitch" endurance records that followed. (J. Nieto)

Right Side View Of St. Louis Robin 1 Showing Lettering And How Fuselage Framework Was Designed For Two Door Installation. Only The One (Front) Door Used On Right Side Of St. L.R. With Step On L.G. Strut.

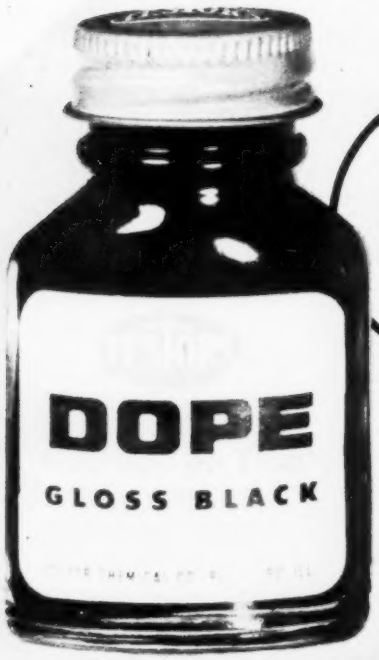
AIR AGE INC. 551 FIFTH AVE. NEW YORK, 17, N.Y.
SCALE: ¼"-1'-0"
FULL SIZE: ¾"-1'-0"
DRAWN BY: Joseph Nieto.

Curtiss Robin Monoplane
General Arrangements & Structural Details.
Endurance Record & Transatlantic Flier.

TESTORS DOPE

on the market...a

all other brands



15¢

...Coss
extra qu

- One Coa
- Easy Bru
- Excelen

TESTOR CHEMI AL

PE...largest seller

..actually outsells

ls combined...

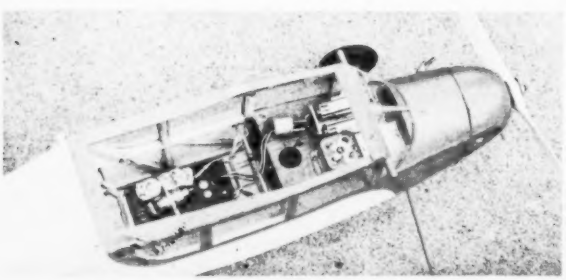
oss a little more, but the
ra quality is well worth the extra pennies

- One Coat Coverage (HIGH HIDING POWER)
- Easy Brushing or Spraying
- Excellent Rubbing Qualities
- High Flexibility
- Film Toughness
- Pure Color Brilliance

MICAL COMPANY • ROCKFORD, ILLINOIS

Looks a bit like an Aeronca *Champ*, don't you think? *Ruddervator* permits advanced maneuvers, like loops, immelmans. Also can use any escapement.

The author makes like a proud poppa. That number 10 on the side indicates that Hank has the answers on rc. He is a veteran fighter pilot as well.



Above—Designed for RK-61 receivers, the *Javelin* is, nevertheless, ideally suited for the MacNabb license-free units. Power is an Ohlsson .19, good power for rc.

Top, left—Radio is accessible through the open top of cabin, eliminating doors.

Left—Wide cabin leaves room for radio, rear, batteries forward. Plug connect.

THE JAVELIN

PART ONE

by HANK BOURGEOIS

A highly maneuverable and stable radio model for beginner and expert. Five of these planes logged almost 500 flights.

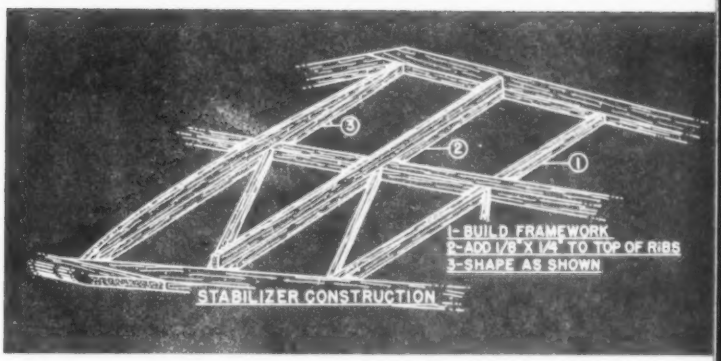
Radio controlled model airplanes are being successfully flown by hundreds of modelers all over the world. You too can have reliable flights by following three simple rules; one, use a proven airplane design and wiring system; two, follow the radio manufacturer's recommendations; three, and most important, use a thoroughly comprehensive testing procedure before each flight.

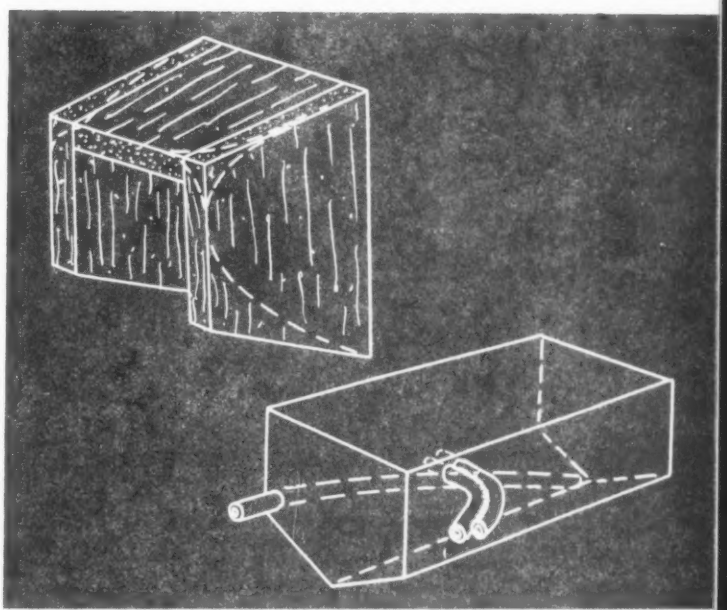
The *Javeline* design is the result of three years experience with radio controlled model airplanes. Five ships of this design have been built and flown by the author with almost 500 radio control flights logged. As with every airplane design, improvements and modifications were made with each new ship. The ship presented here, is designed to exploit the maximum capabilities of the *Ruddervator*. However, it has been flown very successfully with other forms of control mechanisms, such as the two-position self-neutralizing escapement. The latest ship of the five uses tri-cycle landing gear. As yet, not enough flights have been made to completely determine the advantages of the gear. With two-wheel landing gear, the ship is off the ground faster on ROG take-offs, but two-wheel landing gears are prone to ground loop on landing. Previous models using tri-cycle gears were too heavy and the nose gear was always being bent back out of shape on hard landings. Tri-cycle landing gear will give better take-off and landing characteristics.

The small radio controlled model is definitely here to stay; it features high maneuverability, better strength to weight ratio, is quickly built and repaired, and can carry a surprisingly high payload with a small .09 or .19 engine for power. The *Javelin* provides good stable flight characteristics to ease the beginner through his first few flights. After flight experience is gained with the *Ruddervator* control, maneuvers such as loops, Immelmans, and wingovers, along with the usual maneuvers, will become an every day occurrence.

Construction is conventional throughout. Important points will be covered in detail. Although the *Javelin* pictured here used the RK-61 receiver, any of the manufactured radio equipment can be installed. The ship is particularly adapted to handle the MacNabb Citizens Band equipment. The semi-scale design was chosen because of the desire for a model capable of conversion to the PAA rules, by removal of receiver and installation of PAA passengers.

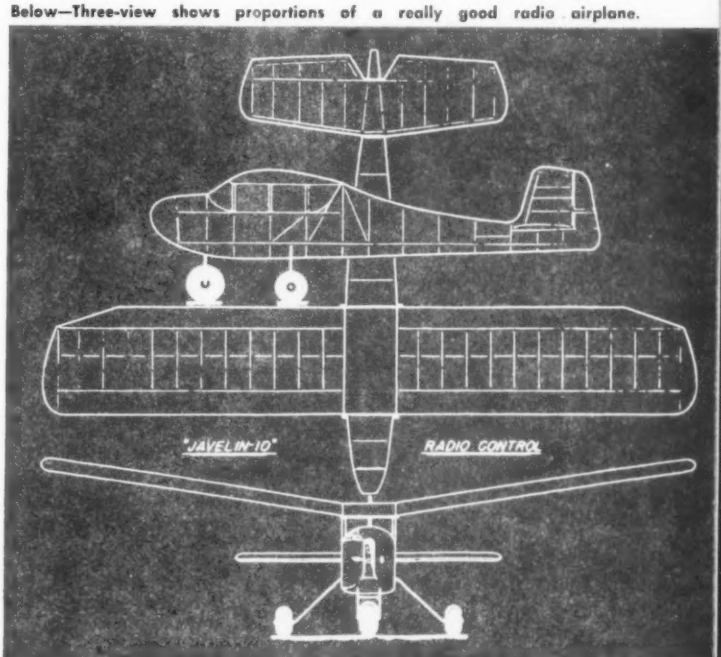
Enlargement of plans is easy. The bottom longeron is straight, all measurements for scaling up the plans can be made from this straight line. Fuselage is from 3/16" square medium-hard balsa, and all joints are double cemented to take many hours of engine vibration. Two fuselage sides are made at the same time, one on top of the other. It's a good idea to soak top longerons in hot water before pinning in place. When longerons are dry, they will hold their shape without warping the fuselage. While the sides are drying, cut out 1/16" plywood battery platform, two 1/8" plywood front formers, and the 1/8" sheet balsa bottom formers. As bottom longerons are straight, the two sides can be assembled in an upright position. Rest the sides on the

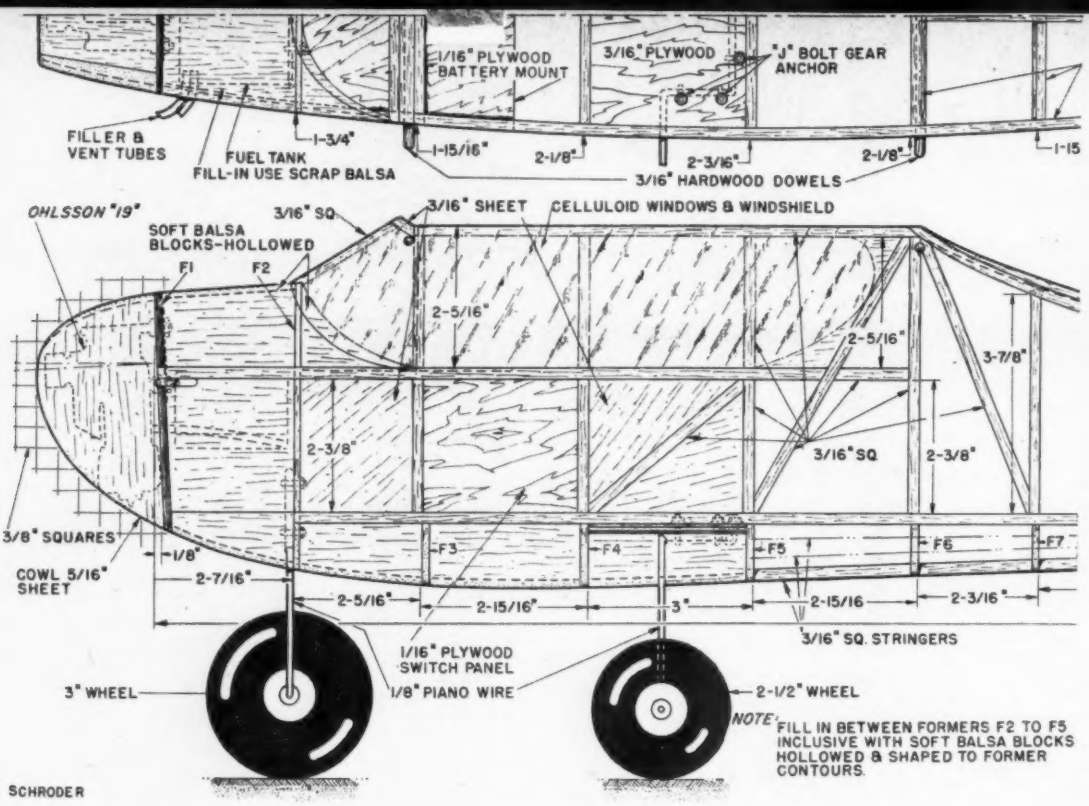




Made from tin can, tanks run 15 minutes on .19. Cowl assembly shown.

Below—Three-view shows proportions of a really good radio airplane.

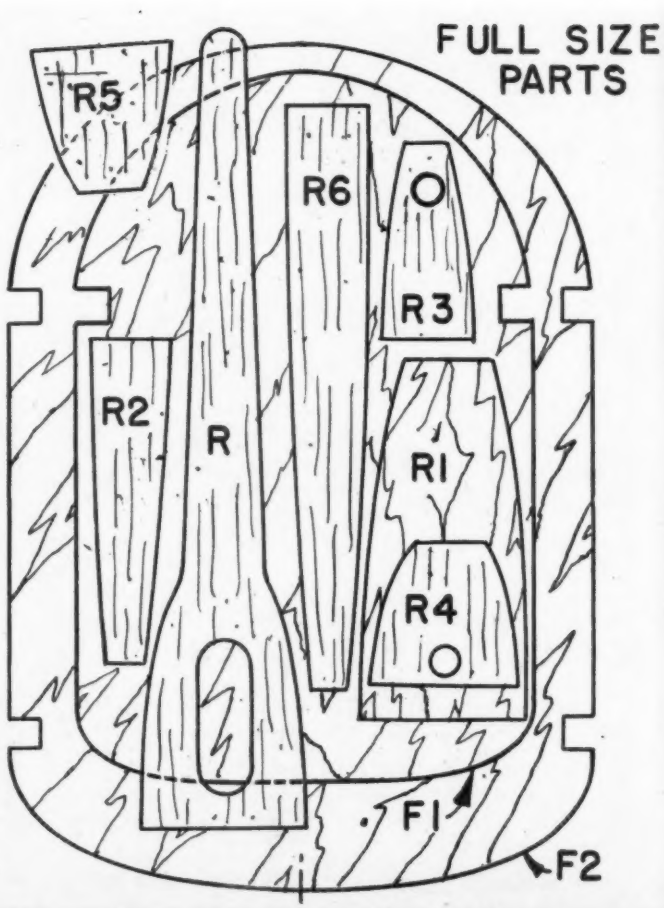


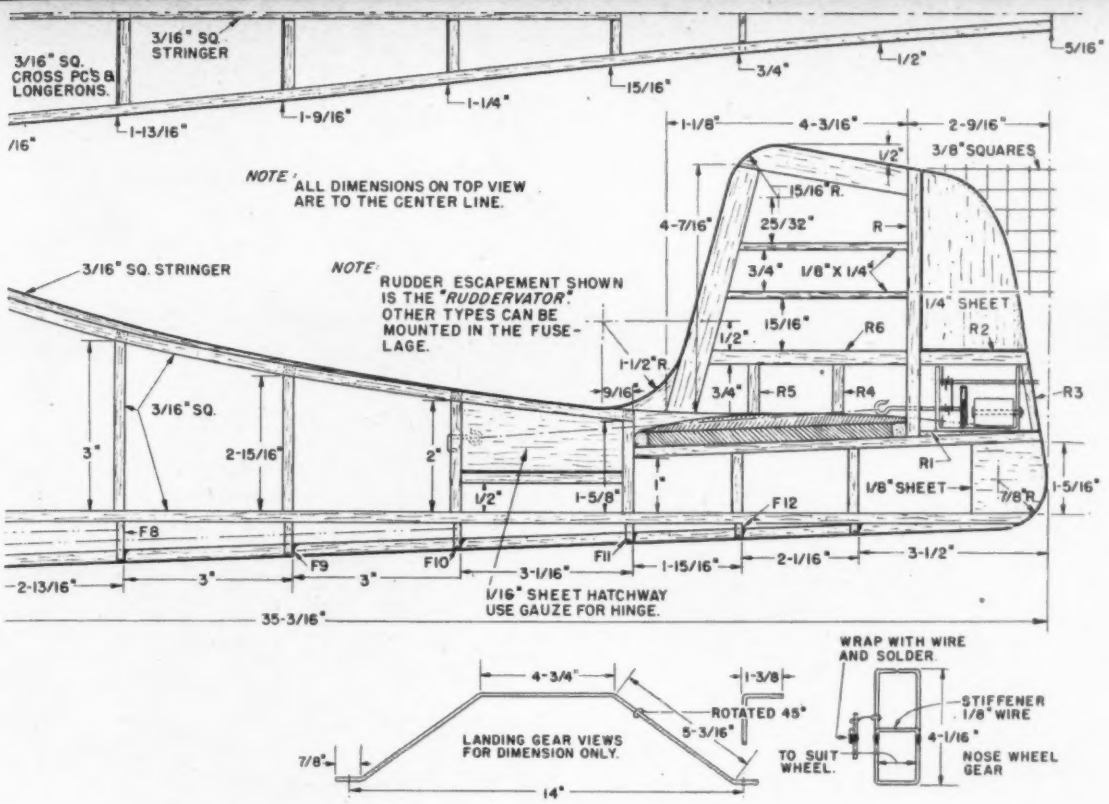


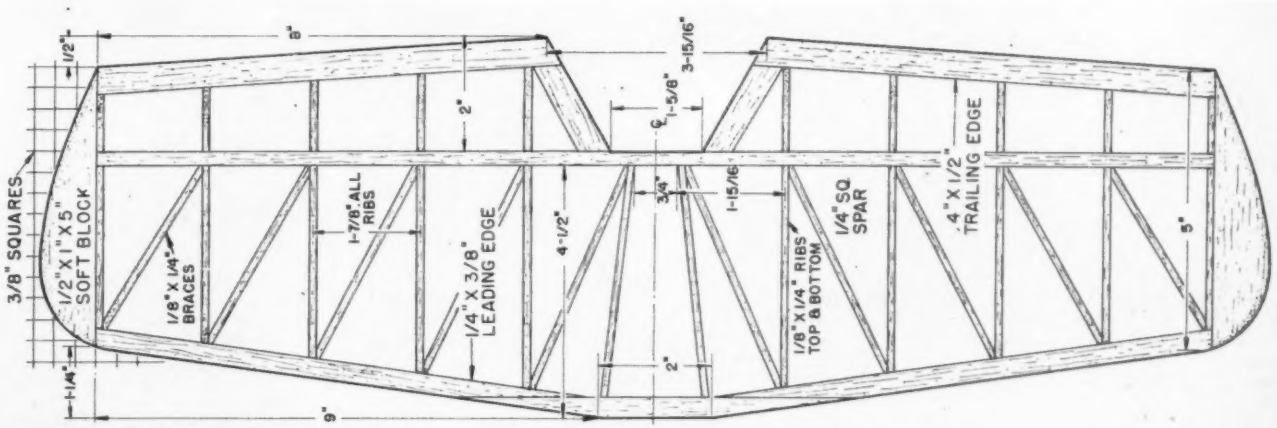
bottom longerons and block in place with books and bottles. Cement the battery platform in place first, then add two front formers. Be sure the firewall has the proper slant, so engine will have proper amount of downthrust. This is important. Now add cross braces, starting at cabin and working back to tail. Fill in sides of the nose section with 3/16" soft sheet balsa. The two wheel landing gear should be bolted in place on the second plywood former, using "J" bolts to hold it in place. If tri-cycle landing gear is to be used, then bolt the nose wheel gear to this former. Use two or three coats of cement over wire and bolts.

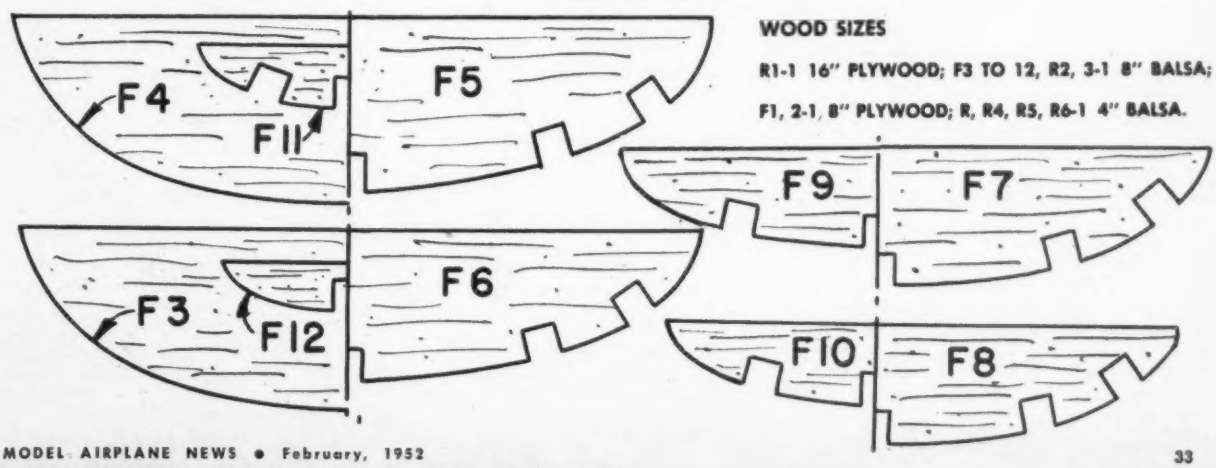
The Ohlsson *.19* engine is mounted radially on the firewall. Solder three nuts to a piece of tin so that the nuts match the three Ohlsson mounting screws, and cement in place behind firewall. The fuel tank is made from an old tin can to shape shown on plans. The wedge or V bottom has proven its worth and will provide fuel to the engine during any maneuvers excepting prolonged inverted flight. Install tank in the nose just behind firewall. Be sure engine mounting screws will not puncture the tank when engine is bolted in place. As a further precaution, brace tank securely on all sides with scrap balsa, so vibration will not crack the solder joints. Filled with Ohlsson No. 2 fuel, this tank will run an Ohlsson *.19* about fifteen minutes.

The tailwheel shaft and axle is bent from 1/16" wire. Bind this wire to the plywood tailwheel mount and cement entire assembly to the aft end of fuselage. With tri-cycle landing gear, leave off tailwheel, bolt rear landing gear legs to the 1/8" plywood platform and cement in place below center cabin window. Soft balsa blocks are used to fill in top and bottom of the fuselage around gas tank and landing gear. Note that the balsa block extends back behind the second plywood former, along the bottom of the fuselage. This block is important. It helps absorb the shock of hard landings. Cement 1/8" sheet balsa bottom formers in place and add the 3/16" square balsa stringers along the bottom. A small soft balsa block is used to fill in the tail end of fuselage. Sandpaper entire fuselage *(Continued on page 50)*







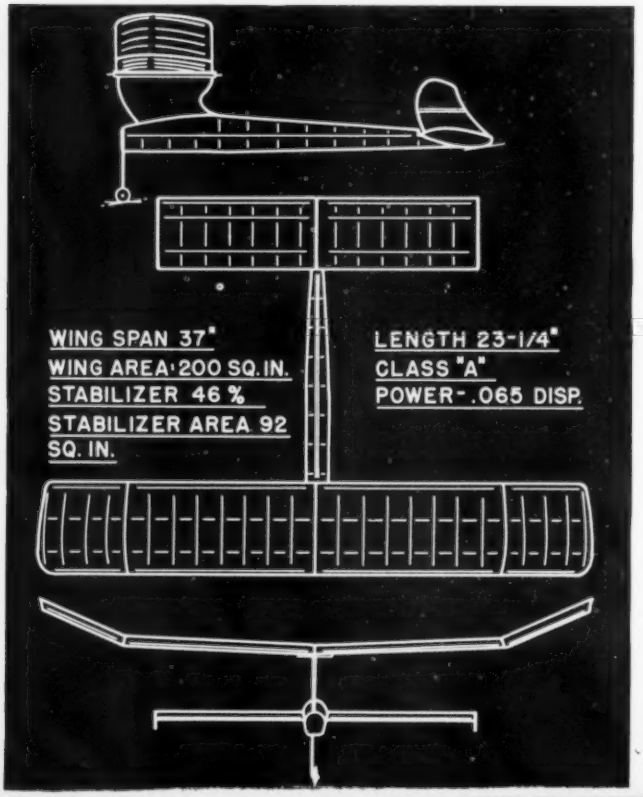


WOOD SIZES

R1-1 16" PLYWOOD; F3 TO 12, R2, 3-1 8" BALSA; F1, 2-1, 8" PLYWOOD; R, R4, R5, R6-1 4" BALSA.

Ready for launch. The power turn is to the right, glide turn very tight to the left. Stabilizer tilt is used for turn. A 6 x 4 prop gave good results.

Full length ribs that go out to the tip eliminate extra loss in efficiency common on small job tapered tips. Below — Convert three-view for large models.



DOUBLE FEATURE

by JOHN SPRAGUE

Designed especially for the Anderson .065 this fine gliding pylon doubles in Classes AA, A by interchanging with .049 Cubs, Torps, Wasps, etc.

A seldom seen two-class combination free flight is the A and AA model. The reason is that the difference in power between the smallest and the largest Class A motors is so tremendous that such a combination would seem to have small chance, at least against the 400-500 square inch jobs. Yet any combination is worth working out and the A-AA ship is not as hopeless as might be supposed.

For one thing, a good AA model can give any free flight a tussle in any but sufficiently windy conditions that would cause the smaller plane to get out of sight minutes before a maximum flight for the day might be obtained.

The *Double Feature* interchanges an Anderson *.065* with an .049 *Torp* or *Wasp*. Its area is approximately 200 square inches. The rather thick wing, combining the Clark Y top and the RAF 32 bottom, permits control with the bigger engine and has a glide that compensates for reduction in climb ability as an AA. The glide is the secret of this airplane. It will outglide the average model and has some rare good traits in adjusting for soaring.

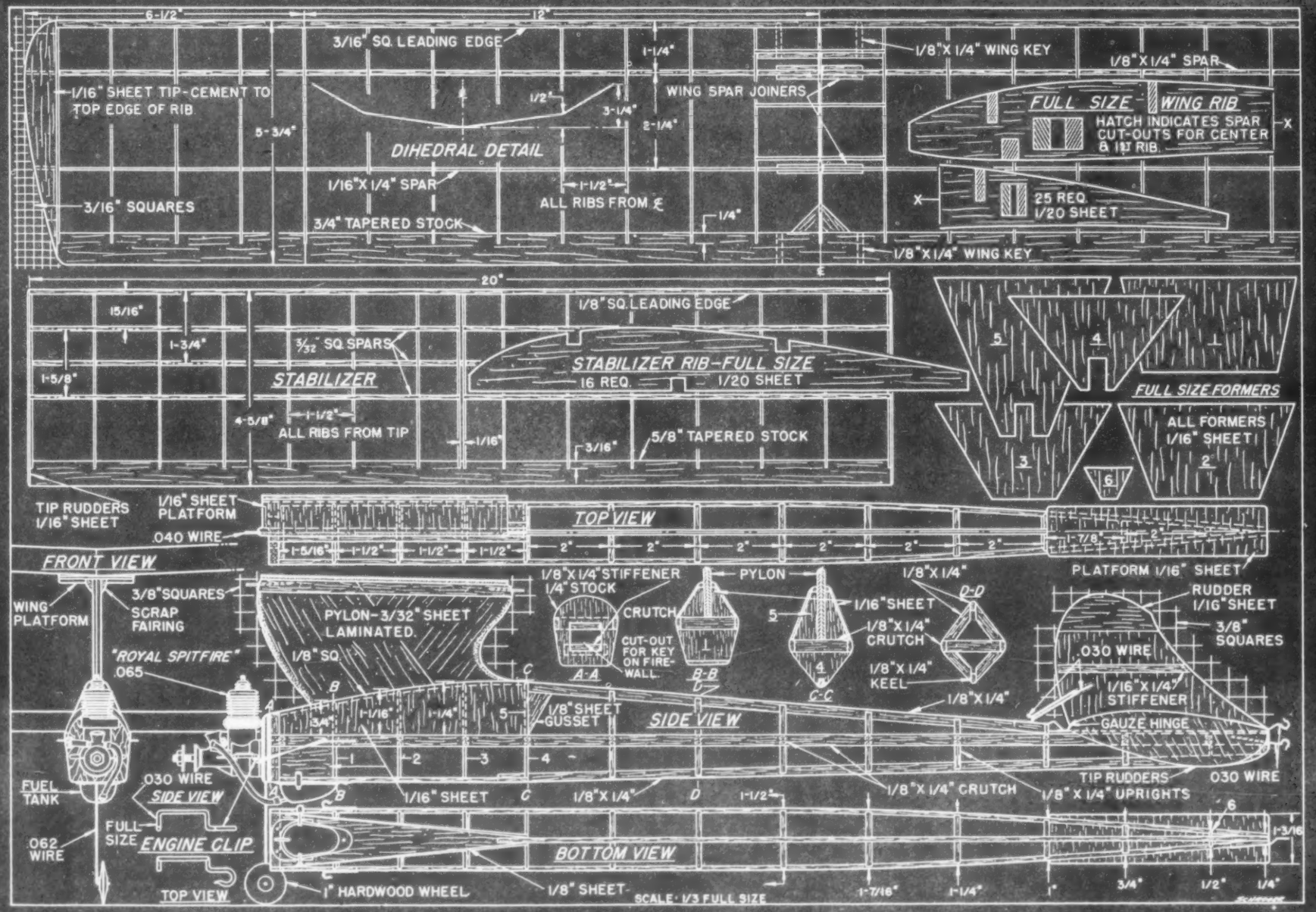
It has great resistance to a stall when gliding and can be slowed up far below the speed for best glide—if you want to. The glide circle is extremely tight and, in fact, the *Double Feature* bobs around in tight circles like many a hand-launched glider. The first test model was lost on entering a thermal 25 feet off the runway. Once in the air, it will pick up anything and is a threat as long as 20 feet remain between it and the ground.

The fuselage is a crutch of 1/8" x 1/4" members with a diamond cross section; top and bottom corners also are 1/8" x 1/4". The laminated pylon of 3/32" sheet mounts on the crutch and is gusseted with 1/16" sheet triangles. The front of the fuselage is sheeted as shown. The bottom, forward is 1/8" sheet. Cross pieces aft are 1/8" square. All details will be found on the plan.

The stab is conventional and is 1/2" thick to compensate for the great lift of the wing. Spars are 3/32" square. The trailing edge should be hard t.e. stock 1/2" wide. Tip fins are laminated from 1/32" sheet. Ribs are 1/20" sheet or 1/16" if you can't get the thinner material. Finished stab is arranged to pop up for dethermalizing. The fin is 1/16" sheet assembled as shown and is coated with well plasticized dope to prevent warps.

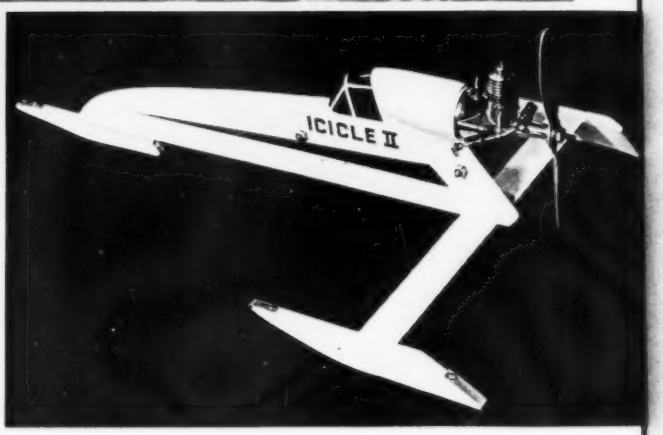
The wing is unusual in that spars run through the ribs in order not to disturb the surfaces and spoil the glide. Front spar is 1/8 x 1/4", the rear ones 1/16 x 1/4". Use hard wood for them and the 3/4" trailing edge triangle stock. Ribs are 1/16", leading edge 3/16" square. Assemble four panels, then incorporate dihedral, using joiners at the joints of spars.

Landing gear is a single .045 wire with one hard wood wheel. Note how the wire sandwiches into the built-up firewall. The *.065* shown in pictures is mounted to the wall with one machine screw which runs through the ply into the threaded hole normally used for attaching the (*Continued on page* 44)


6-1/2"
12"
3/16" SQ. LEADING EDGE
1-1/4"
1/8"X 1/4" WING KEY
1/8"X 1/4" SPAR
1/16" SHEET TIP-CEMENT TO TOP EDGE OF RIB
WING SPAR JOINERS
FULL SIZE WING RIB
HATCH INDICATES SPAR CUT-OUTS FOR CENTER & TIP RIB.
1/2"
3-1/4"
2-1/4"
5-3/4"
DIHEDRAL DETAIL
1/16"X 1/4" SPAR
1-1/2"
ALL RIBS FROM ℄
3/16" SQUARES
3/4" TAPERED STOCK
1/4"
25 REQ. 1/20 SHEET
1/8"X 1/4" WING KEY
20"
15/16"
1-3/4"
3/32" SQ. SPARS
1-5/8"
STABILIZER
1/8" SQ. LEADING EDGE
STABILIZER RIB-FULL SIZE
16 REQ. 1/20 SHEET
4-5/8"
1-1/2"
ALL RIBS FROM TIP
1/16"
3/16"
5/8" TAPERED STOCK
FULL SIZE FORMERS
ALL FORMERS 1/16" SHEET
TIP RUDDERS 1/16" SHEET
1/16" SHEET PLATFORM
.040 WIRE
TOP VIEW
1-5/16"
1-1/2"
2"
1-7/8"
FRONT VIEW
WING PLATFORM
3/8" SQUARES
SCRAP FAIRING
PYLON-3/32" SHEET LAMINATED.
1/8" SQ.
"ROYAL SPITFIRE" .065
1/8"X 1/4" STIFFENER
1/4" STOCK
CRUTCH
CUT-OUT FOR KEY ON FIRE-WALL.
A-A
B-B
PYLON
C-C
1/16" SHEET
1/8"X 1/4" CRUTCH
1/8"X 1/4" KEEL
D-D
1/8"X 1/4"
PLATFORM 1/16" SHEET
RUDDER 1/16" SHEET
3/8" SQUARES
.030 WIRE
1/16"X 1/4" STIFFENER
GAUZE HINGE
1/8" SHEET GUSSET
SIDE VIEW
1-1/16"
1-1/4"
3/4"
FUEL TANK
.030 WIRE
SIDE VIEW
FULL SIZE ENGINE CLIP
.062 WIRE
TOP VIEW
1/16" SHEET
1/8"X 1/4"
1-1/2"
1/8"X 1/4" CRUTCH
TIP RUDDERS
1/8"X 1/4" UPRIGHTS
.030 WIRE
BOTTOM VIEW
1" HARDWOOD WHEEL
1/8" SHEET
SCALE- 1/3 FULL SIZE
1-7/16"
1-1/4"
1"
3/4"
1/2"
1/4"
1-3/16"

ICICLE

by RICHARD YALE



Icicle II may have no wings but it practically flies. Body, fins, and skids are full size on the drawing. Can use other propellers. Right—Rear-quarter view clearly shows the assembly of components.

You want to see something really move? Then try this AA ice boat, tethered or "free flight."

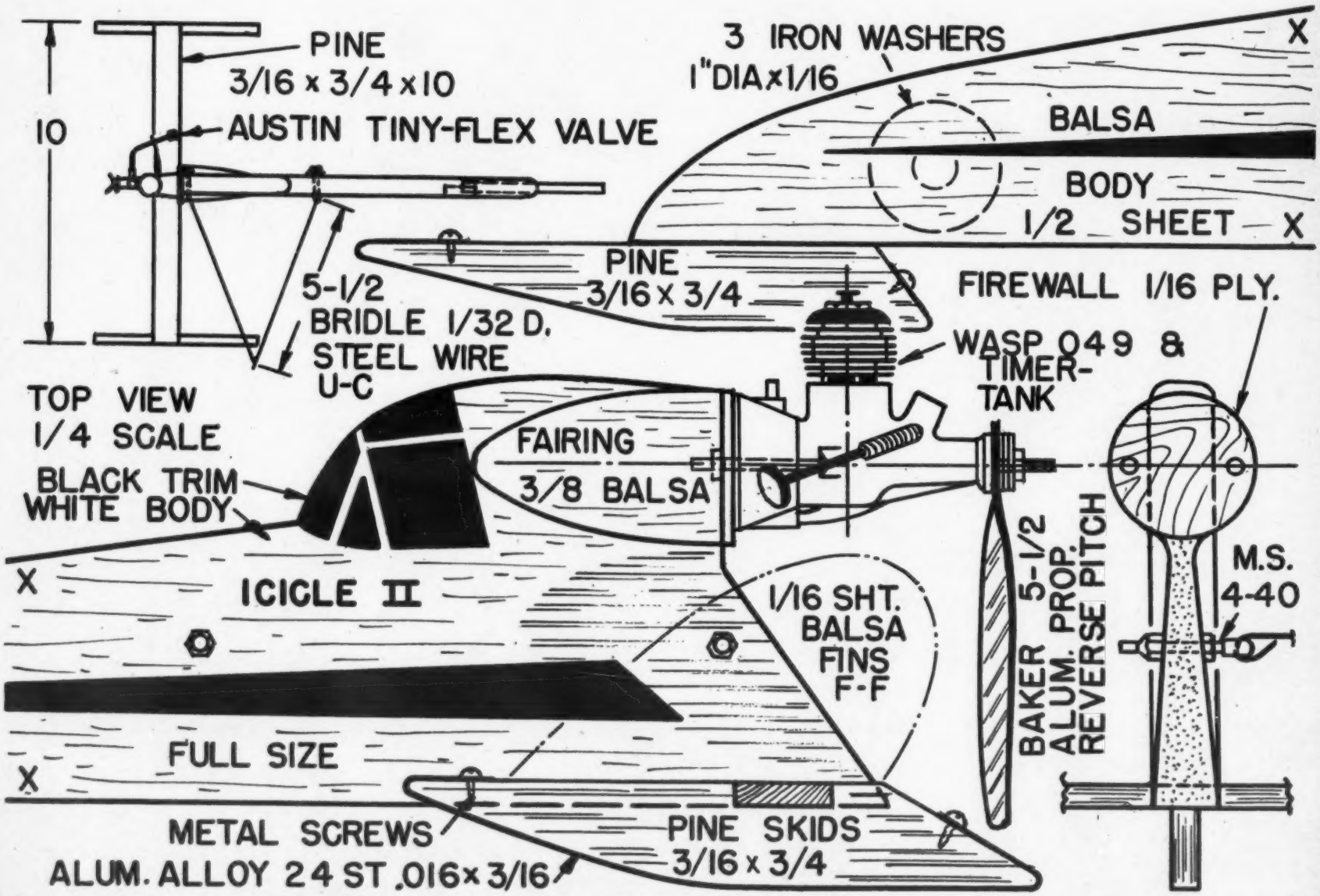
This tethered ice sled can be built by a novice in one day. *Icicle* is powered by the hot little *Wasp .049* engine and slides along effortlessly on its aluminum runners which cut drag down to almost nothing. For those who wish to run in straight line, free flight style, twin air fins are shown which should be mounted on top of the rear skids. A timer-tank should be used to cut engine run down. Be cautious in chasing your ice boat across a lake or pond where you're not positive of the ice thickness!!

Start construction by cutting the body profile from 1/2" thick sheet balsa. Cut out the motor fairing blocks to outline from 3/8" sheet balsa and cement in place. Carve corners off body and fairing blocks so rear is 1-3/16" diameter for firewall mounting. Sand all corners smooth with #2/0 paper. Body is thinned at rear as shown and sanded smooth with #2/0.

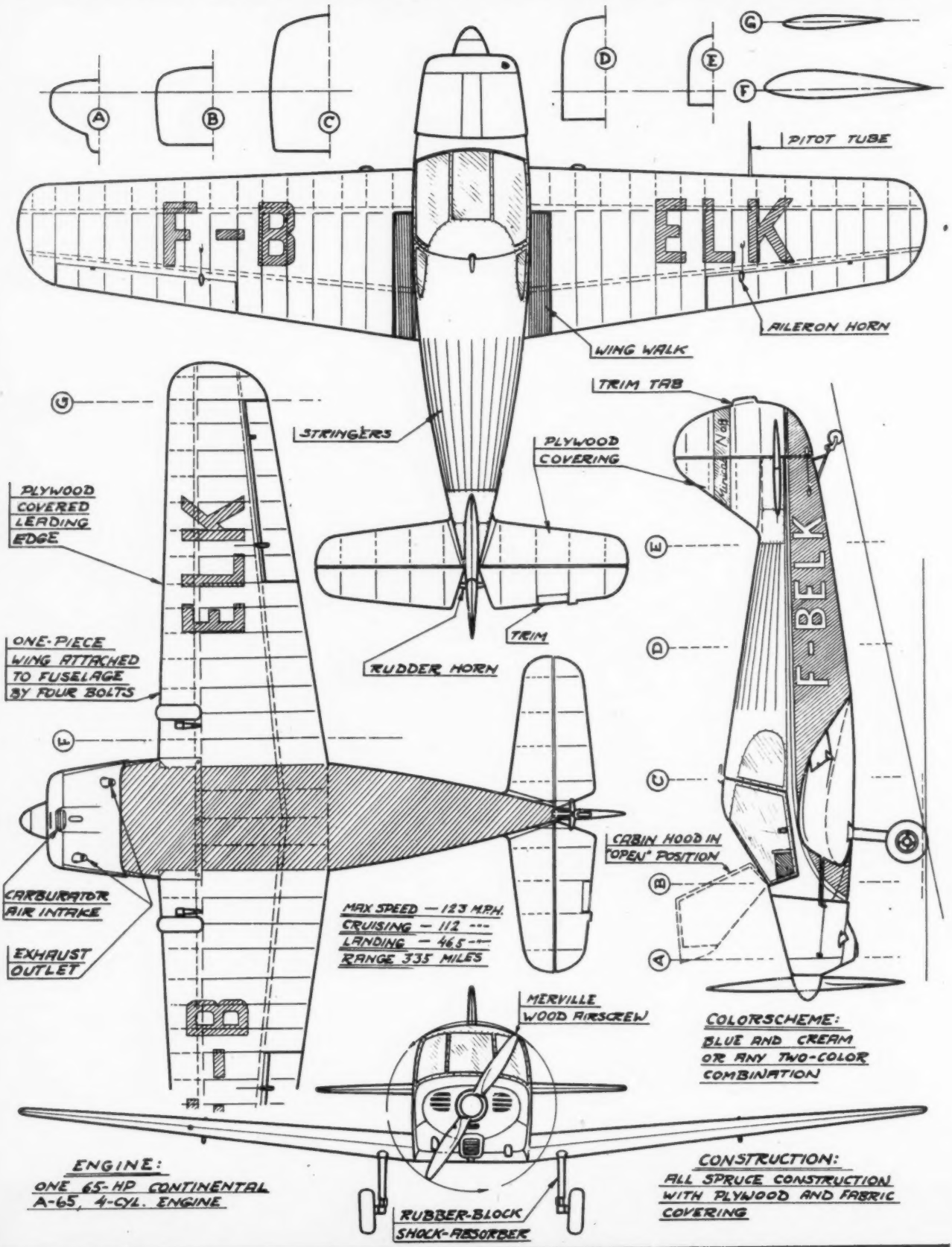
Notch the body at rear for crosspiece which is made from 3/16 x 3/4 x 10" pine. Make the two rear pine skids also from 3/16 x 3/4" pine stock. Notch for tight fit on crosspiece. Cut front skid from same stock. At this point, the aluminum alloy .016 24st skids are cut and fitted to each skid. Strips are 3/16" wide and fastened with small sheet metal screws or wood screws. Other metals such as tin or brass may be used. Thickness is not too important and most anything will do. File burrs off edges of strips. Weldwood glue is used to cement all joints. First place crosspiece in rear notch and glue well. Attach both rear skids with glue and add front skid. Set on flat surface and check structure for perfect alignment. While this is drying, make firewall from 1/16" thick mahogany firewall. Attach *Wasp* engine and timer tank with 3-48 screws on the engine. Cement motor in place. Bend bridle from 1/32" steel wire. Brass screws 4-40 with 1/16" hole in head make perfect fittings for attaching bridle to body. Place screws at each end of bridle and close wire loops. Drill 1/8" holes as indicated for attaching bridle. Secure with plain nut on right side and stop-nut on left side. Remove for painting later.

Add one ounce weight to front of body. This can be done with three iron washers one inch diameter x 1/16" thickness. Imbed on right side and cover with 1/16" sheet balsa. Give body one coat clear dope and sand with #400. Cover body with Jap tissue and clear dope. Brush cold water over wet dope and smooth with fingers. Paper will tighten upon drying and leave smooth, tough undercoat for paint. Sand again with #400. Brush on six coats thinned white dope, sanding between each coat with #400. Use masking tape to outline arrow on side of body and windows. Paint with two coats of black dope. When paint is dry, rip tape away. Attach bridle and add name in decals. A stock Baker aluminum 5-1/2" diameter propeller has pitch reversed by merely holding hub in vise and twisting blade next to hub with pliers.

To test make pylon base from heavy board 2 x 12 x 12". A ten-penny nail in board is the pivot. Tether line is .012 diameter steel wire 10 feet long. Start engine and give slight push—then get set for some fast motating. Other AA engines may be substituted.


PINE
3/16 x 3/4 x 10
AUSTIN TINY-FLEX VALVE
10
5-1/2
BRIDLE 1/32 D.
STEEL WIRE
U-C
TOP VIEW
1/4 SCALE
BLACK TRIM
WHITE BODY
X
ICICLE II
FULL SIZE
X
METAL SCREWS
ALUM. ALLOY 24 ST .016 x 3/16
3 IRON WASHERS
1" DIA x 1/16
X
BALSA
BODY
1/2 SHEET
X
PINE
3/16 x 3/4
FIREWALL 1/16 PLY.
WASP 049 &
TIMER-
TANK
FAIRING
3/8 BALSA
1/16 SHT.
BALSA
FINS
F-F
BAKER 5-1/2
ALUM. PROP.
REVERSE PITCH
M.S.
4-40
PINE SKIDS
3/16 x 3/4

Planes Worth Modeling - C.A.B. MINICAB



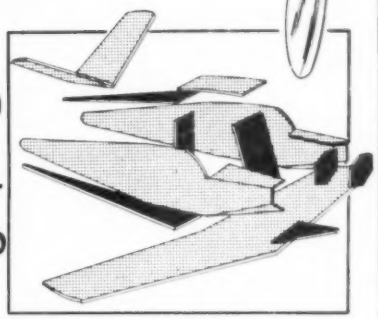
SCALE: 1/4" — 1' 0"	C.A.B. MINICAB	DRAWN BY: ISJØRN HAFELSTRØM
DATE: OKTOBER — 51		

18 MIN. FROM KIT TO 1st FLIGHT!

Cleveland's "Quicky" BONANZA

59¢ ea.

Only 12 separate balsa parts to cement together! It's the most easily built scale job you've ever flown!



QUICKY SETS ARE THE MOST SIMPLE, THE MOST REAL, AND THE BEST FLYERS OF THEIR KIND

Remember these "Quicky" facts! They are engineered to fly several hundred feet. **They can be assembled in an hour on your first try, and have actually been put together in 18 minutes** — There is no cutting, no tissue covering, and no painting to do, you merely assemble, then fly them — All of their few parts (only 13 to 21 parts) are predecorated, diecut, and each one interlocks with the next, so that a snappily finished model grows into shape before your eyes, even if you've never built a model in your life. Just compare the superior job of predecorating we've done, with any others! (all Quicky sets except jets now include rubber). All you need is a batch of Cleveland "Quicky" sets (get them all — you won't regret it) and a tube of cement.

NEW!

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ALSO—

SILVAIRE
AERONCA
PIPER CUB

NEW!

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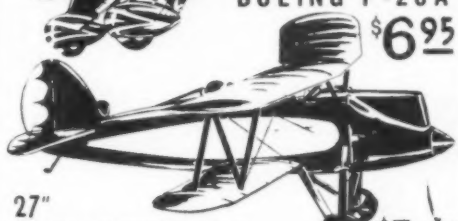
1" SCALE PREFABS FOR STUNT & SPORT

28" BOEING P-26A $6.95



27" GREAT LAKES TRAINER $5.95

BUILD THESE, AND BE PROUD OF THEM!

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All the curved balsa parts are diecut, and they interlock without fail, assuring fast, pleasant construction. Included are such popular features as shaped, notched, wing edges - formed celluloid bubble canopies - three-color decals - quality tissue - preformed landing gear wire - turned wheels - and many other outstanding features such as a handy "notcher" (A Cleveland development) which makes smooth work of the few small notches that cannot be diecut. Furthermore, the directions for assembly have been organized in step-by-step order, and are illustrated clearly with sketches. Everything needed to complete the model is in the kit, with the exception of liquids.

Those of you who have built "IT" kits in the past will really take to the "Simplex" kits too, as they carry the ideal of realism and flight engineering into the realm of prefabrication. Simplex models are much bigger than the spans (15 to 20") imply, as their fuselages are huge compared to the spans.

These 3 sleek jets are among Uncle Sam's most talked about, most promising fighting jets, and you'll see them in the headlines, and in the newsreels every day. Ask your local hobby dealer right away, for the biggest dollar's worth of model yet to be seen! — He'll show you the "Simplex" kits!

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RICH & LEAN

It takes all kinds of opinions to make the modeling world go round.

Indoors Defended

I was a little puzzled by some statements in the report on the 1951 Nationals in the Nov. MAN, which said that indoors flopped so badly that it could be dropped but that team racing needs a transfusion. Let's have a closer look at things.

How much encouragement and support has indoors had from Plymouth in the last year? How many plans, pictures and articles about indoor models have been published recently? Is Texas at the center of indoor activity or is it literally thousands of miles from the indoor centers such as Boston, Philadelphia, Detroit and Los Angeles?

On the other hand, how many team racer plans have been published in the last 12 months? How many contests held? How many kits on the market?

The facts are that this highly publicized event drew only 18 entries at Dallas while poor old indoors drew 96, 26 in the microfilm events alone. . . . Even stunt, by far the most popular control line event throughout the country, drew only 61 entrants.

. . . There is a great deal of confusion as to what a national contest really means. Some think that all contests should be ones in which the beginner has as much chance to win as the expert. That the FF gas events are approaching this state is evidenced by the fact that they are the most popular, and also produce the most ridiculous times. I agree that these events are important because they do give encouragement to the newcomer and are a lot of fun. However, of equal importance are those that are decided not on the basis of who finds the strongest thermal but on merit. These are the events where the most carefully thought out model flown by the most skilled flier invariably wins. These are also not the most popular events, at least when judged on the basis of the number of entrants. These events separate the men from the boys and include radio control, team racing, Navy carrier and indoors. These events always draw fewer entrants than FF gas because one need to do more than assemble a pre-fab kit, stick a hot engine in it and throw it into the nearest thermal. . . .

I also take exception to the implication that an indoor contest is less of a strain than an outdoor meet. The indoor flier must have iron nerves to handle his fragile models. He cannot make a false move for fear of ruining all of his efforts. And have you ever sweated out a long flight near the roof where a girder may mean the end? Believe me, in my many years of active competition I have never experienced anything as tiring as a top-rate indoor contest.

I agree that the method of picking the national champion which was used at Dallas is unsatisfactory and does award a number of easy points. The trouble is in awarding points in each age class in every event. This gives a junior placing first with a mediocre time as big a leg on the championship as the specialist such as the FF gas flier, the speed man and the indoor builder the opportunity to take more than one first in events which are fundamentally the same. A better scheme would be that used in 1949 whereby age classes are disregarded and only points from one event in a group of similar events are allowed toward the championship. This insures that the top man is a mature all-around modeler, as he should be. The national champion should not be a speed flier, or a FF gas flier, or an indoor flier. He should be all of these and more.

I would support a plan to combine age classes in those events where all of the competition is in the open group, as it is in indoor. This has already been done in radio control and some others and does reduce the number of trophies which must be given.

Before we start tossing out events let us see what the Nationals really are. They are more than just another big contest; there are enough of those already. The Nationals is the one meet of the year where you can find every type of model represented. They provide the stiffest competition in the greatest variety of events to be found anywhere in the world; let's keep things that way. . . .

George DeLaMater
St. Johns, Missouri

Big Engine Lover

Especially pleasing to me is your sudden return to features on class B and C or even larger, stunt. Of course the little AA's are nice and all that but a lot of us still like the larger motors and we intend to continue using them.

Another thing to consider is the fact that the motor makers have put a lot of time and money into the development of these splendid engines and I hate to see them go to pot one by one. If you fellows keep up the good work you may give "stunt" the shot in the arm that you gave free flight. A magazine like M.A.N. exerts a lot of influence. More power to you.

Eric Saunders
Toronto, Ontario, Canada

Attention, Hot Rocks

. . . I think free flight in general has it all over control line flying (anyone can make even a rock fly on the end of a wire). Naturally, everyone to his own tastes but it takes far more skill to make a good free flight work and return safely in one piece, and to me the height of eye catching appeal and skill is a free flight scale model of a W.W.1 plane. At least, "them's my sentiments."

Grover W. Moore
Corona Del Mar, California

The Gentleman Dissents

After reading the article by Mr. Paul Del Gatto in December M.A.N., want to write a few words in rebuttal.

The evaluation of comparisons between freewheeling and folding propellers must take into account several concepts not noted in the article.

1. P/D ratio—There was no mention of the pitch-diameter ratio. Any modeler with much experience working with a FW (freewheeler) on the Wakefield type soon realizes that a P/D ratio between 1.5 and 2 is a must. Using a pitch common to a Wakefield folder (20 to 24 in.) with a 20 inch diameter is suicide for the glider if freewheeled.

2. Weight—There is no mention of weight of the model. We know that some models fly faster than others usually attributing the change in airspeed to a thinner airfoil or increased weight. It appears that with a FW setup on a Wakefield a slow glide is more important than a flat glide. In other words the slower the model flies the greater the effectiveness of the FW in relation to the folder. Any increase above the minimum weight (8.1 oz.) affects the FW more than the folder.

3. Airfoil—An RAF 32 section substituted for a flat-bottomed Clark Y type, keeping everything else unchanged, gives a noticeably slower glide allowing the FW to turn more slowly and increasing its relative efficiency.

4. Decalage — The angular difference between the wing and stabilizer is usually about three degrees. Any decrease in the angular differential (*Continued on page* 48)

CONRAD CONROD
By Bob Godden
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HUH?
LOOKS LIKE SPAR STOCK CONNIE — YOU CAN TELL 'OLE BILL SUMMERS—
CONNIE? HUH?
CONNIE?
A WEEK LATER—
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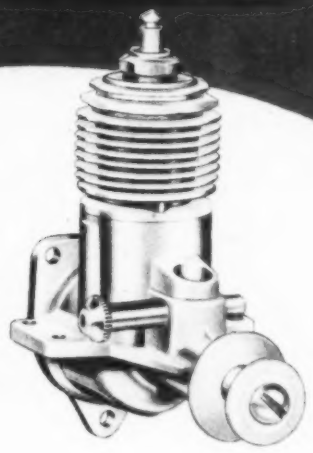

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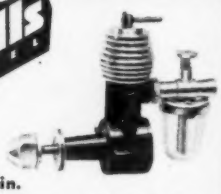

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Curtiss Robin

(*Continued from page 25*)

and every part of the ship to standards customarily employed in the company's military designs. The *Robin's* aerodynamics were very thoroughly tested in the Curtiss wind tunnel. Numerous experiments, design changes and wing and cabin arrangements were tried and the best one finally used. Particular attention was paid to control surface design.

In the structure, Curtiss engineers drew on their military experience to incorporate features seldom found in any but service aircraft of the period. The fuselage, made of steel tubing, was braced by the Warren truss method, eliminating all wires and their subsequent adjustments. "Alclad", so new at the time that trade descriptions carried an explanation of what it was, was utilized wherever other sheet metals had been used before. Alclad also was used as wing rib material.

The design of the *Robin* covered a lot of territory in "new features" for the private pilot. The wing, which spanned 41 feet was a semi-cantilever type, braced by two struts on each side. Originally the struts were of rather generous chord, with ribs built up on the steel tube basic strut and covered to provide additional lift. It was possible to alter the incidence of the front struts to aid in trimming the ship. Upper extremity of the struts terminated at an auxiliary structure attached to the lower surface of the wing, to reduce interference as much as possible. Lower strut ends terminated at the bottom of the fuselage, where they formed part of the *Robin's* rugged landing gear structure. Ailerons and control surfaces were unbalanced, but designed to give full control at the stall, with low stick loads over the entire speed range. The stabilizer was adjustable in flight by means of a lever at the pilot's left. The tail skid was steerable, and engineered to give ground manuverability about that equal to brakes without the expense of brakes. As the *Robin* landed at only 40 mph fully loaded the skid provided sufficient braking power.

Seats for the *Robin's* two passengers were side by side behind the pilot, and were adjustable fore and aft. The pilot sat in front in the middle. His instruments comprised the basic group: tachometer, thermometer, oil gauge, altimeter and airspeed indicator neatly mounted in a convenient panel.

Fuel for the *Robin* was carried in welded aluminum tanks set in each wing root and were available in two sizes, giving a total of 30 gallons and 50 gallons. Fuel was fed by gravity from either tank.

The first four *Robins* were built and tested at the Curtiss, Long Island, New York plant. Not wanting this new commercial venture to interfere with military production, a completely new company — Curtiss-Robertson Airplane Manufacturing Co. — was formed and a new plant erected at Anglum, Missouri, near St. Louis, for construction in quantities.

Production was begun in mid-1928 on the original type powered by the Curtiss *OX-5* engine. An interesting sidelight to the powerplant is that Curtiss had 1150 brand new *OX-5's*, plus spares, left over from W.W.I.

By 1929, the demands for higher power and better performance were met by installing the Curtiss *Challenger* engine in a number of *Robins*. The Challenger was a 170 hp, six-cylinder, air-cooled radial. The cylinders were staggered somewhat similar to a twin-row engine, and in effect two three-cylinder engines, one behind the other.

An additional model of the *Robin*, highly modified but retaining the general appearance of the original, was built for the Army Air Forces under military designation *XC-10*. This model never was put into production.

With the *Challenger* engine and 50 gallons of gasoline, the *Robin* showed a top speed of 120 mph, landing speed of 47 mph, cruised at 100 mph, a service ceiling of 16,460 ft., absolute ceiling of 19,000 ft., and a cruising range of 514 mi. With the *Challenger* engine, the *Robin's* gross weight was 2,600 lbs.

In 1929 there began a rash of refueling endurance flights. Planes and crews remained aloft, taking their fuel from a "tanker" plane, until one or the other broke down. The refueling endurance flight craze began in California that year, when an Army Fokker trimotor *Question Mark* landed after remaining aloft for 150 hrs. 40 min. 15 sec. Shortly thereafter, a pair of civilians in California, Reinhart and Mendell, did the Army one better by setting a new record of 246 hrs. 43 min. 32 sec.

The prospect of establishing a real record to shoot at appealed to two flying pals in St. Louis—Dale Jackson and Forrest O'Brine—late in 1929.

Jackson and O'Brine established a record of 420 hrs. 21 min. 30 sec. The plane they chose for their record was a *Challenger*-powered *Curtiss Robin*. Refueling was done through a trap door in the top of the cabin, and catwalks on either side of the nose permitted the fliers to make adjustments on the power plant during flight. This record ship was named the *St. Louis Robin 1*.

The record stood until mid-1930, when John and Kenneth Hunter, in a *Stinson Detroiter*, remained aloft 553 hrs. 41 min. 30 sec., from June 11 to July 4.

But Red Jackson and Obie O'Brine were not to be outdone. They secured another Challenger *Robin*, the *Greater St. Louis*, and took off from Lambert Field, St. Louis, on July 21, 1930. They circled over Lambert for 647 hrs. 28 min. 30 sec., refueling and making minor repairs much as they did on the previous record flight.

Not much was heard of the *Robin* until 1938. Early that year, a young man named Douglas Corrigan was tinkering around with an old, weatherbeaten, fourth-hand *Robin* at Long Beach airport in California. He had outfitted his *Robin* with long range fuel tanks; in fact, the cabin was so full of fuel tanks there was scarcely room for him to sit at the controls.

On July 17, 1938, he took off from New York with the avowed purpose of returning to California, but somehow went the wrong way. Twenty-eight hrs. 13 min. later, he landed in Dublin, Ireland, much to his amazement; he had thought it was Long Beach, California. "Wrong Way" Corrigan had flown his ancient *Curtiss Robin* 3,150 miles in the wrong direction to set a new aviation city to city record, to say nothing of a record in naivite. His boyish innocence in the matter belied a marvelous job of navigation and mechanical maintenance on his old *Robin*.

By 1938 the *Curtiss Robin* had become almost extinct. Although changes in the ship by the factory, and by its owners as "modernizations" were many, the *Robin* remained essentially the same throughout its life as the plane that held so much promise in 1928.

Dihedral was introduced in some models. The airfoil sectioned lift struts were varied or removed entirely in others. Where the early models used rubber shock absorbers enclosed in a streamlined casing, other models of later vintage enjoyed air-oil shock struts. Even the tail skid of the original was replaced by a tail wheel in later models. To these ships wheel brakes were added.

In its day, the *Robin* was as modern as the minute. THE END.

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Double Feature

(*Continued from page* 34)

tank. A profile tank is mounted flush against the bottom of the fuselage. Eye dropper types may be use but are apt to give mixture-change problems as the fuel is consumed. Timer tanks and/or an engine timer can be used. The *Torp* or *Wasp* attach flush to the firewall assembly in which case wire hooks must be added to the wood for stretching the hold-on rubber bands to the hooks on the sides of the fuselage. Some trim changes should be expected when engines are changed and it may be necessary to adjust for different amounts of torque.

Covering was yellow on the fuselage and orange. *Sky Sail* or *Silkspan* covering can be employed. Wet cover after having doped all surfaces to be covered. As wing and tail surfaces dry, watch for warps and remove them before things set up permanently. Warps can be corrected when doping and even later by steaming the doped surface and holding in the desired position. Give three coats of half dope and half thinner, mixing about six drops of castor to the ounce of dope on the last two coats to prevent excessive paper pull. Grain runs spanwise on flying surfaces, lengthwise on fuselage.

Flying is conventional. Power turn is to the right and the glide to the left. A large amount of tilt—left side high—on the stab is required for tight turns. Avoid use of rudder trim tab if possible. Keep slowing up the glide, adding tilt and you will be amazed at the extremes to which you can go. Thrust adjustments are easy with the detachable nose. Slight down and left may be required.

The Zenith

(*Continued from page* 17)

help to keep the weight down. The original weighed ten and one quarter ounces.

Cement three pieces of 3/32 x 2" soft balsa together for each side of the fuselage. While these are drying cut out all the fuselage bulkheads; you will find that the bulkhead Nos. 1 and 7 are undercut on the lower sides for the added fuselage stiffeners at the front and rear of the fuselage. Bulkhead No. 7 is 1/16" mahogany plywood. Do not use balsa on No. 7, as this bulkhead acts as the pivot for the stabilizer leading edge when the tail pops up.

Cut out the fuselage sides, sand and then add the fuselage stiffeners at the front and rear. These are made of 3/32" med. hard balsa. When dry, join the fuselage sides using bulkhead Nos. 1, 2, 3, allow to dry and then add bulkhead Nos. 1B, 4, 5, 6, 7, 8. Bulkhead No. 8 is 1/8 sq. 3/4" long. Next cover the top and bottom of the fuselage with 3/32" sheet, balsa running the grain with the width of the fuselage. Cement in firewall No. 1-A. Note that this model has two firewalls, No. 1-B that fits between the fuselage sides and butts up against the front of the fuselage stiffeners, and then No. 1-A which cements on in front of fuselage, thus giving better shock resistance. Add the top fairing bulkheads No. 1-C and side fairings No. 1-D. Allow to dry thoroughly and then sand fuselage all over. Drill holes for the engine mounting and cement nuts to the rear of firewall. Drill 1/8" holes for the front and rear wing dowels and front stag dowel. Cement sub-rudder in place. Note that on this model the rudder trim tab is located on the sub-rudder. Cement the rear stabilizer hook of 1/16" wire into the fuselage and also 1/4" O.D. aluminum tubing to hold the fuse. Cut hole for *Spitfire* timer and cement in place or use screws, if you prefer. Cement front windshield in place, noting that the windshield pattern has dotted lines. If you crease the windshield along these dotted lines it will be much easier to install and a minimum of pins will be required to hold while drying. Cement side windows and dowels in place. Cut out two pieces of 1/32 x 5/16 x 9/16" copper or brass, drill 7/64" hole through as noted on plans and then solder each half of the landing gear to these plates, solder on spreader bar. This type of installation permits mounting the gear on the outside of model and it is easily detachable with the engine. Give fuselage about three coats of clear dope

and follow with two coats of colored, then two coats of fuelproofer.

The stabilizer ribs are made of 3/32" stock. Note that the ribs overlap the leading edge about 3/32". The stab is of conventional construction. The leading edge is 1/4" sq. and the trailing edge 3/64" x 3/4" tapered trailing edge stock. Spar is 1/8 x 3/8", the tips very soft 1/4" sheet balsa. Add gussets while stab is still on board. The rudder is made of 3/32" balsa. The cutout in front of the rudder automatically stops the stab at the correct pop-up position, approximately 45 degrees. Sand rudder and then give one coat of dope. Pin it to board while drying. When stab has dried, sand and cover with Jap tissue or comparable covering material, give three coats of clear dope. Cement rudder on stab, then give rudder two more coats of clear dope, sanding lightly between coats, and add the hold down hooks at the front and rear of stab. It is best to key the stab so it will not move. This is easily down by cutting pieces of 1/8" dowel about 1/4" long and then splitting them. This gives a flat gluing surface. Hold down stab with rubber bands and cement keys in place on bottom of stab. Give stab and rudder two coats of fuelproofer.

The front of the trailing edge of the wing must be raised up 1/16" to conform with the correct airfoil shape. Shim up the trailing edge and pin in place on the plans. Taper leading edge as noted on plans and pin it in place. When cutting the ribs it would be best to leave them about 1/32" long and then sand them to fit as they are inserted in place. Next cut out gussets and cement in place. The tip gussets are made of 1/4" sheet balsa. When wing is dry remove from the board and insert the spars; allow to dry thoroughly and then trim down and sand the leading edges and tips. Part wing at the outer dihedral joint and put in specified tip dihedral. Dihedral braces are made of 1/8" medium sheet balsa. No dihedral brace is required on the trailing edge at the tip dihedral joint; the gussets do this job well enough. Join the wing in the center. Be sure to insert center rib on the spare before joining wing. Do not put gussets in the center section panel or there will not be enough room for the sheet covering; after the wing has been joined, sheet cover the center section with 3/32" soft sheet balsa. Note that the sheet covering is inlaid between the ribs, not on top. Sand entire wing structure lightly. Cover wing with Jap tissue or comparable covering material, then give three coats of clear dope and two coats of fuelproofer.

The floats are built entirely of 3/32" sheet balsa. No leading or trailing edges other than the sheet balsa were used as sheet balsa seemed to be sufficient strength. Cover bottom of flat with 3/32" sheet balsa. Notch sides of float to take a piece of 1/8 x 1/4". Wrap a piece of 1/16" I.D. one inch long brass tubing to a piece 1/8 x 1/4" balsa with thread and then insert unit into notch. Cover top of float with 3/32" balsa. The floats are then placed on the landing gear. Prop up the front of the floats in the following manner. Pin the trailing edge of the float to the board and then place a piece of 1/8" sq. under the step of float; while in this position cement on float attachment hooks of 1/16" music wire. When dry, remove from board and coat liberally with cement. After building rear float cut slot in top as noted on plans. To install rear float, cement to the sub-rudder at proper angle. Dope the floats well. Give at least four or five coats of clear dope and two colored.

Balance model 3-1/4 inches forward of trailing edge. Test glide a few times. When a smooth glide is attained you are ready for power flight. Set the rudder tab over to the left about 1/32". This model should climb in a wide right circle and glide in a flat right circle. Set timer for about ten seconds, run engine a little rich and then launch model. If the power flight is too tight it can be corrected by moving the tab. Thrust adjustments are not necessary as tab adjustments will do the job just as well. When tab is set cement it so it will not move. If the circle in the glide is not tight enough it can be tightened by tilting the stab so the left side is low; this will tighten up the circle to the right. Never move the rudder tab more than a 1/64" at a time. It is very effective. At all times use a fuse, even when testing. Many a good model has been lost on a five or six second test hop.

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FUEL WEIGHT (MIN.)	.2 oz	.28 oz	.3 oz	.4 oz
TOTAL WEIGHT	.4 oz	.88 oz	1.4 oz	2.9 oz
THRUST (MAX.)	.6 oz	1.2 oz	2.5 oz	4.0 oz
DURATION - ONE CHARGE	12 sec	20 sec	20 sec	12 sec
DURATION - TWO CHARGES	—	—	32 sec	24 sec
DURATION - THREE CHARGES	—	—	—	36 sec
TORQUE	NONE	NONE	NONE	NONE
EXHAUST VELOCITY	1200 ft	1200 ft	1200 ft	1200 ft
OVERALL LENGTH	1 1/16"	2 1/4"	2 7/8"	3 3/4"
MAXIMUM DIAMETER	7/16"	1"	1 1/32"	1 1/8"
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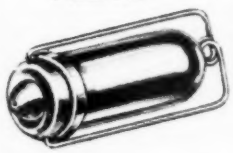

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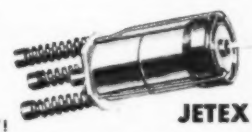

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Air Ways at British Nationals

(*Continued from page 18*)

brother Alan, who piled up 330 points out of a possible 400, with a very fast Elfin 2.49 diesel powered semi-scale. Although only a medium moment-arm job (without flaps), we have seldom seen tighter loops, bunts or eights. Brian gained his second place (323 points) with a two year old Yulon 30 (gloplug) powered design. A typical Nats entry in stunt featured 200-300 sq. in. of wing area, side-mounted motor, drop out undercart and good semi-scale appearance. Most competitors favored diesel in preference to glo-motors.

In speed, no new design trends were apparent—British diesels being used in the smaller models and American glo-motors (McCoys' etc.) in the larger classes. Mike Billington and Dick Taylor teamed up to walk away with class three (McCoy 19—95.16 mph), class four (112-24 mph) and six (McCoy 60—128.29 mph). This was the first time that speed had been included in the program.

Free flight has enjoyed a big come-back this season and entries for this event totalled 134. Pete Wyatt won comfortably with two maximum flights of five minutes each (15 second motor run). His model is a conventional pylon (medium height) with sharp tip dihedral and undercambered wing section. The fin is fixed to the fuselage and placed forward of the stabilizer to allow the latter to tip for D/T purposes. The undercarriage is the single leg whisker type and the powerplant a sidemounted Elfin 2.49 diesel. Other models entered ranged all the way from Half-A's of 150 sq. in. to 1000 sq. in. monsters.

The rubber and glider events took place on the first day of the meeting, in very poor weather conditions, Ron Warring winning the former with his *Zomby* Wakefield (627 seconds) and J. Lamble the latter with 497 seconds. In both these and the free flight power, the aggregate of two flights counted for points. Gliders were mostly about *Nordic* A-2 size, but several eight and ten footers were seen going up on the towlines. In R/C, Sid Allen won with a simple slabsider cabin.

—BILL DEAN.

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M.A.N. At Work

(*Continued from page 2*)

Two other guys had rc's so we all had fun.

▸ Clubs are wonderful things. Should be more of them. Backbone of flying. If only clubs would undertake to admit even five little fellows. Should think that the older guys would get a bang out of organizing teams of juniors within the club with leaders as captains. Would be a thrill for the younger squirts and enthusiasm would bubble over. Anyway, these *Screamin' Demons* have spirit. They had a corking good time though they froze their ears. Bill Jonke, their president, wanted to know who called the club the *Sky Demons* in a recent issue. It is *Screamin'*—with no G. That do it, fellows?

▸ Broadfield Billings was at the contest. Billings was an old timer before we had even started to build models. He had a going factory turning out gliders and stuff 25 years ago and he still makes catapult gliders today. Had two realistic cabin gassies. Instead of tieing the wing on with rubber, he has two sturdy music wire clips that go through the cabin top and snap around dowels running lengthwise. The plywood support at the front end of the dowels is adjustable by a set screw for incidence. Wings stay on in flight, too. Billings has a sense of humor. The cabin windows had lace curtains made from paper doilies.

▸ Attended a meeting of the Connecticut Chapter of the AMA. Over 70 people from clubs throughout the state. Frank Bushey presided. Russ Nichols, Matty Sullivan, Bud Gay, Hank Struck, were among many well known modelers. Bushey told us how the CCAMA had clicked. Interesting feature is that clubs in that state don't have to refrain from flying at their own contests. Each club supplies several personnel at any contest they attend. Result is that no club is afraid to put on a contest, especially that scary first contest. Always sure of help and know-how. Mike Adajian told us about the flying jalopy contests tried in New Britain and which are spreading to other cities as well. Something like team racing, only there is no restriction on the plane except that it have no more than a .29 for power. Races are longer. What kind of a ship is best for this free for all? A team racer! Results are splendid in that many beginners and non-contest boys are getting out to fly.

▸ Russ Nichols wound up with a story that brought down the house. A golfer who didn't like the lie of the ball put it on top of an ant heap. He missed the ball but hit one side of the heap, killing 50 ants. On his second swing, he killed 50 more ants. Just then, one of the two remaining ants turned to the other ant and said, "If we want to survive, we'll have to get on the ball."

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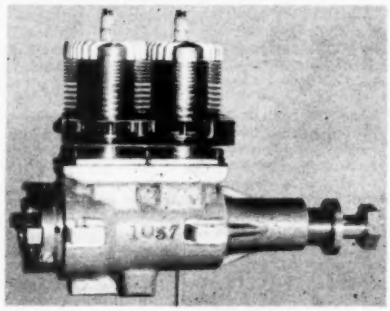

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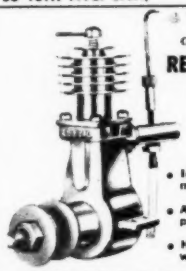

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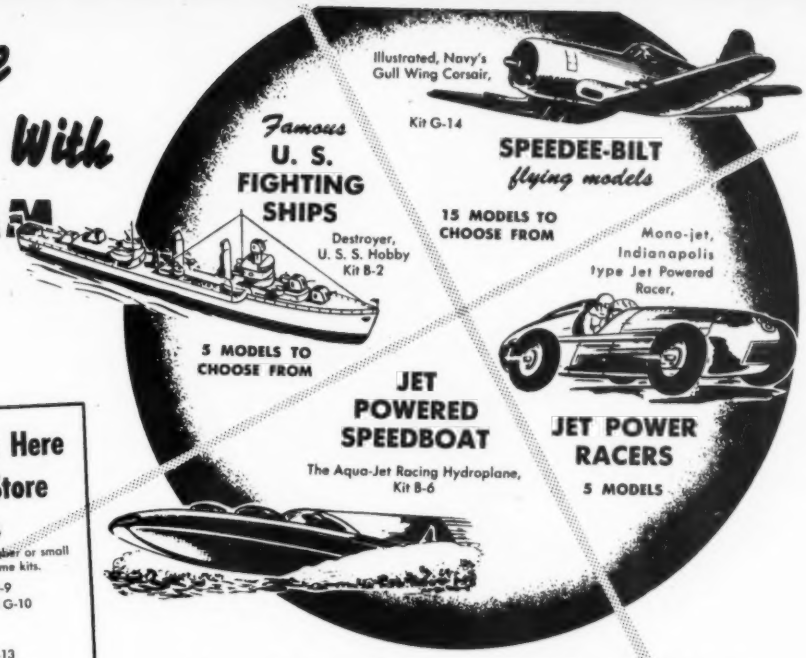
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20 YEARS AGO

Compared with the fine bill of fare in today's M.A.N., the models and plans published in the February 1932 issue remind you that the hobbyists then had to be long on enthusiasm. The models they were given to build had only one virtue, and that was that they flew.

Contests were nothing like the meets we have today. In the whole country there was but a handful of clubs, so the burden of organizing and sponsoring such affairs usually fell on promotion-minded department stores like Stix, Baer, and Fuller, in St. Louis —that February issue listed SBF contest results—and Jordan Marsh in Boston. Around New York several stores sponsored their own clubs. M.A.N. itself put on many a contest. Many of them were indoors and, generally, these were held in some cavalry armory. At four o'clock the hosses would take over, while some guy's luckless 15-minute flight floated overhead, getting nearer and nearer to the flying hoofs. Ah, but it was peaceful. Not even a gas engine!

Something important happened in February 1932 M.A.N. Charlie Grant ran his first model of a series, an all-balsa R.O.G. Anyone who remembers knows those "CG" models. All of them were tremendous fliers for the day and are still as good today as they were 20 years ago. The text that ran with the model discussed in the simplest form various factors that were required for a flying model. Eager modelers gobbled up this informative stuff. Few people could make a stable airplane in those days.

citement. Such flights now number in the hundreds of thousands, yet each such flight

Transatlantic flights were still the chief ex-

only two decades ago was a death-defying stunt. H. J. Heindell had an intriguing article about the transatlantic planes, from the Navy *NC-4* to the 12-motored DO-X. Alcock and Brown who flew eastbound in 1919 with a Vickers *Vimy* two-motored biplane included a modeler. Alcock was holding one of his pet models in the picture published by M.A.N.

Those were depression days when it was like pulling teeth to save two bits for a flying model kit. Got so that some manufacturers put two solids in a five-cent kit. Ideal, in New York, used the back cover of M.A.N. to tell the modelers about three 15-inch fliers in one box for the then sensational price of $1.50.

Who was Frank Luke? Twenty years ago, Luke was remembered quickly as America's second war ace. J. Noble wrote his remarkable story. Luke, a hell-for-leather Arizonian, had a meteoric career in his *Spad*. The great "balloon buster," he knocked out 14 sausages and four planes in 17 days. Shot down, he was killed on the ground fighting his captors.

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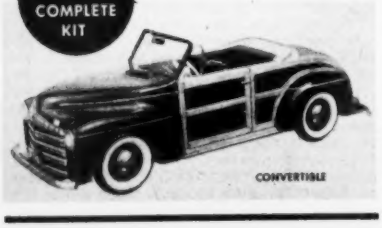

Build the Beaver

(*Continued from page 12*)

struts are 1/8" x 3/8" balsa. We suggest that you only spot cement these in place as they are more of a nuisance during flying than their appearance is worth. License numbers and other details may be hand painted or decals. If decals are used, be sure to brush a coat of clear hot fuel proofer over them for protection.

Before any test flights are made, check the balance of the model. Above all, do not have the model tail-heavy as this will prove disastrous on the very first flight. If anything, you should have the model nose-heavy for the first few flights just to feel your model out. The balance point recommended is 1/2" aft of the leading edge of the wing. It is wise to attach a 1-1/2" x 1-1/2" flat tin plate with Scotch tape to the outside wing leading edge near the tip to create a slight yaw, thus holding the model out on the end of the wires. This can be taken off later when you know that your model will not fly into the lines. Exercise due caution during the initial flight periods and you will be rewarded with a fine replica of the *Beaver* that will give you many hours of swell flying.

Planes in the News

(*Continued from page 15*)

someone else to do. So McDonnell was out, the Army was out, the Air Force has by now lost two years' worth of production, and we taxpayers take it again.

There's another angle to this *F-88* deal which bears telling. It appears that the order for the escort plane was to have gone to the Lockheed *F-94D*, a developed version of the current two-seater all-weather fighter which more-or-less guards New York, among other locations. The *F-94D* is supposed to have been a difficult plane to produce, and so McDonnell was the contract winner by default.

(This produceability angle on the *F-94D* strikes one a little the wrong way, because Lockheed is one of the most wide-awake firms in the aircraft industry. Their "Hall of Giants," home of huge machine tools, is merely one indication of the engineering effort that Lockheed throws into its designs. It doesn't seem like that firm to design a plane which can't be built.)

Anyway, that's what the reports say. But there's still a hitch. McDonnell has committed all of its St. Louis factory space to the production of the *F2H Banshee* and the *F3H Demon* for the Navy. There is no unassigned Air Force space for production around the country except the old Martin plant at Omaha, Nebraska. That space is now the headquarters for Strategic Air Command, and they ain't movin'.

So McDonnell is expected to squeeze the *Voodoo* in somewhere, someway, and then if the production numbers are increased, somebody else—maybe an automobile outfit—will have to be called in on the job.

So in brief, the Air Force's next long-range fighter will be the McDonnell *Voodoo* —designation, *F-88A* for the production job. It won one contest, but didn't get any prize. It lost another contest, but got the production prize because a "better" airplane couldn't be built by a firm which knows most of the answers about building airplanes. And right now, there isn't any space to build the *Voodoo* anyway.

▸ *Auster B.4*—The second plane of the month is the little English Auster *B.4* ambulance-freighter. This perky little job is a logical extension of the flying boxcar idea to a small craft, with excellent results.

I saw this Auster perform at Farnborough, England this year. It flies in what might best be described as a snappy way. Even allowing for the fact that performance is much a reflection of pilot skill, the little Auster bounded and cavorted around the gusty skies of Hampshire like a spring lamb.

Auster, as you may know, got started in England by building the Taylorcraft under license agreements. That's why the lines may have that familiar look.

The *B.4* is basically the front end and wings and tail of a standard Auster, but the fuselage has been reduced to the minimum needed to hold on the tail. By doing this, the tail can be placed high on a boom, and the major portion of the fuselage section can be opened up in a single door.

Inside, stretchers or seats are interchangeable. Or the fuselage floor can be left fairly clear for cargo.

To modeling for the moment—this layout seems like an ideal one for R/C jobs. You have a fairly roomy fuselage which can be reached neatly and which, in any decent scale, will hold all the R/C gear you have. The design is right, the plane is a type which flies well, and has good stability characteristics. To my knowledge, this is the first pod-and-boom single-engine craft, but I could be wrong.

▸ *New Sabres*—News of two new *Sabre* models was received from North American Aviation. The *F-86F* is to be built at the Columbus, Ohio plant; the *F-86H* is to be made in Los Angeles. Basically, the *F* is similar to the standard *E* now in production; but there will be a step-up in the thrust rating of the General Electric *J-47* engine used to power the craft.

The *H* is a different cat, however. It is going to be similar to the standard *Sabre*, only bigger. The whole horizontal tail will be power-boost controlled, will be larger, and without the dihedral of the current tail. Some other improvements will be made in the mechanisms for dropping wing tanks, bombs and rockets.

▸ *Fairchild Turbojet*—*YJ44* is the designation of a new expendable baby turbojet made by the engine division of Fairchild Engine and Airplane Corp. Rated at 1000 lb. sea-level static thrust, the *YJ-44* weighs 325 lb., is 6 ft. long and 22 in. diameter. Compressor is axial-flow.

▸ *Pinwheel*—Rotor-Craft Corp. has developed the weirdest single aircraft since the days of the great experiments. This thing is a two-bladed, rocket-propelled helicopter which is strapped to the back of the spy or GI and he's off in a cloud of exhaust. Nearest thing to the Buck Rogers rocket belt, the pinwheel weighs less than 100 lb. The people who make the gadget say that the rocket motors are throttle-controlled and emit no flame during operation. If this is so, they should forget the copter and sell the motors, because those two objectives have been in the minds of rocket motor people during the past decade. Like the tag line of the old joke, this we gotta see!

▸ *Bell ASW Copter*—The *XHSL-1*, big Navy anti-submarine copter, is nearly done at Bell's Buffalo plant and will be shipped to Ft. Worth for flight trials around the first of 1952. Craft uses the Bell rotor system, has overlapping tandem rotors. A commercial equivalent has been reported to carry 20 passengers and to cruise at 120 mph. (*Auster* photos courtesy of Aviation Week.)

Rich and Lean

(*Continued from page 40*)

may tend to promote a better glide. The decalage can be narrowed more with a FW than a folder. Lowering the angular difference is poor practice with a model equipped with a folder which is thrown into a severe stall for the stall will usually worsen. With the FW to help dampen any poor attitudes into which a model is thrown by wind currents or any disturbing force, the incidence of the wing can be decreased.

5. C/G position—The C/G position has been the brunt of much discussion since the advent of the long Wakefield model. As the stabilizer moment arm is decreased the effect of the stabilizer increases and more work can be assigned to it. Hank Cole balances his long model about three inches behind the trailing edge of the wing. As the stabilizer assumes more of the load (which is fixed) there is less left for the wing to carry and the glide tends to better—actually the wing loading is less.

6. The article *departed* from the scientific method and did *not* control conditions by lowering the landing gear when using the FW, decreasing the climb and impairing the glide, completely invalidating his results. Springs of any sort on a FW setup are taboo too.

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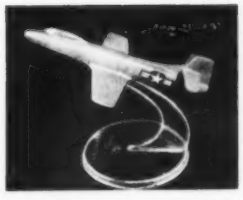

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The Duster

(*Continued from page 20*)

which tapers from 5/8" at the top to 5/16" at the bottom. After the cement has dried, the two open edges of 1/32" sheet are cemented together at the open edge to form a tear drop section. The strut now can be sanded and covered with tissue for added strength. The wire hinge is then cemented on and the completed is fastened to the fuselage by soldering a small washer on the opposite side of the fuselage.

The prop is carved from a light block 1-1/4 x 3-1/2 x 21". The block is first X'ed out like an indoor prop, and is of constant pitch which has proven superior when it comes to dead air flying and your ship doesn't have a thermal to take you up. Cover the prop with tissue or light *Silkspan* over which several coats of dope are applied with intermediate sandings until a smooth finish is obtained. The blades should have a maximum camber of not more than 3/32" and also be trimmed quite narrow so that they will fold against the fuselage without too much overlapping; this is the reason the large diameter propellor is used so that the blade area can be kept fairly high.

The wing should be built in halves for best results. A rib template of aluminum or thin plywood should be made first, in order to obtain a better uniformity of ribs. The ribs are cut from light quarter-grained 1/32" sheet and after 31 of them have been cut out, they should be pinned together, sanded and notched for, if you have spars that zig-zag in a multi-spar wing, it probably will warp very easily. Pin down the trailing edge first, then, using a couple of ribs as a spacer, pin down the leading edge. The ribs are now inserted and cemented as is the balsa tip. The two top spars of hard 1/16 x 1/8" balsa can now be inserted and cemented. Be sure that the cement has thoroughly dried before removing from the plan, and insert the two bottom spars and cement. The dihedral breaks can now be put in without the danger of a warped wing. These should be reinforced with short pieces of 1/16 x 1/8" hard balsa running across the break.

The construction of the stabilizer is similar to that of the wing but it is important that the entire tail assembly be made as light as possible, due to the long moment arm of the airplane. The rudder is built flat on the plan and should be thoroughly dry before removing, for it is hard to keep track of your adjustments with a warped rudder. The subrudder is cut from soft 1/8" sheet balsa, sanded to a streamlined shape and covered with tissue.

Now that construction has been finished, all parts should be sanded smooth with fine sandpaper. The whole model should be covered with Jap tissue; red is preferable for the best visibility under all conditions but, with the five and six minute rules now in effect, bright colors are not really necessary. The wing and stabilizer are covered with the grain running spanwise, the fuselage with it running lengthwise, and the rudder running vertical. All surfaces, including the fuselage, are single covered. After water shrinking all surfaces, two coats of thin dope are applied. More dope can be applied later but too much dope while everything is new only increases warps. After the fuselage has been covered and doped, a plastic or large celluloid canopy can be cemented to the bottom of the fuselage to bring the ship up to Wakefield cross section, or it can be left off for flying in the unlimited class. The rudder is cemented to the stab with a slight offset for a right turn.

Two different motors have been used in this ship with equal success; 22 strands of 1/4" flat T-56 rubber 52-inches long or 16 strands 1/4" English Dunlop 52" long. The motors are a little shorter than the distance between hooks but after prewinding a motor it will stretch, so that inserting it into the fuselage will be no problem. It is important that there is no slack in the motor; if a few knots form in the tail section these will upset your glide trim. The motor should be lubricated well with castor oil which does not dry out as do some of the glycerin and soap mixtures. Also, if you do not wind motor to capacity, unless at a contest, it will last many times longer. It also should be removed from the plane when not flying and stored in an airtight can or jar. If for some reason you should get dirt on the motor, it should be washed and relubed before winding, for it only has to be wound once with dirt in it to be ruined.

The rubber motor, propeller, and tail assembly should be placed on the fuselage so that the balance point can be obtained. Then, wing mounts can be cemented so that the ship balances one inch in back of the trailing edge of the wing. Test flying should be done in calm weather either early morning or late evening for there are fewer thermals at that time. The model should be test glided, varying the incidence and not the wing position, until a long flat glide is obtained. The power flight should be easy once a good glide is obtained. Although a little extra downthrust should be used during all early test flights for, on this ship, as the power turns are increased the need for downthrust is greater.

During tests, we found that when everything looked perfect on a half to two-thirds of capacity winds, it would stall out sometimes when fully wound, due to additional torque straightening out the climb on the initial burst. By using more downthrust than was really necessary we got past this stage of testing a lot easier and, when we saw that the ship was straightening out too much in the power burst, we added more rightthrust to keep it in a spiral climb. After a few tests on near capacity winds we cut away the downthrust a little at a time until we got fairly close to the stalling point. All of this, of course, is calm weather testing and a little extra downthrust makes it a lot safer when flying in the wind.

The Javelin

(*Continued from page 32*)

to remove any sharp edges.

The stabilizer is now completed so it can be installed in place on the fuselage before the *Ruddervator*. Stabilizer construction is a little unusual though much simpler than rib and spar construction. The 1/4" square spar should be the hardest balsa you can find. Build stabilizer on a flat board to prevent warping. Pin the spar, and leading and trailing edges in place. The ribs are 1/8" x 1/4" medium hard balsa. After cementing in place, add another strip on top of each rib. This additional strip should cover both leading and trailing edges. When dry remove stabilizer from the board and add soft balsa tips. Now sandpaper to the airfoil shape shown on the plans. The center section is covered with 1/16" sheet balsa, run grain spanwise. Cover with *Silkspan* and give three coats of clear dope. The stabilizer is now cemented in place at minus 2-1/2 degrees with the bottom longeron.

With stabilizer in place the *Ruddervator* may now be installed. Before installation, let's discuss the control possibilities of the *Ruddervator* and make some minor adjustments. For those who have never seen a *Ruddervator* in action, the control tab rotates freely in the airstream as if it were a propeller. The tab can be stopped in any one of four positions, that is, up, right, down, or left. The right and left rudder positions are actually stopped 45 degrees from the vertical so that the rudder positions give some up along with the rudder. This combination rudder and up elevator delays the inevitable spiral dive by holding the nose up in the turns. A control tab of sufficient size to give satisfactory rudder control without overcontrolling, does not have enough area to make the up and down positions effective. This fault can be overcome by enlarging the control tab, but of course, this makes the rudder positions overcontrol. What must be done is to change the *Ruddervator* mechanical stops so that the rudder positions stop 65 degrees from the vertical. This decreases the amount of effective rudder, and increases the nose up tendency. The flight results of the above settings is to make the entry into the turn nose high, gaining a little altitude; the ship then loses some forward speed and no more altitude is gained. From then on it will circle without loss of altitude.

By increasing the area of the control tab the effective up and down is also increased; however, it still is not positive enough to do a loop from straight and level flight, or a

(*Continued on page 52*)

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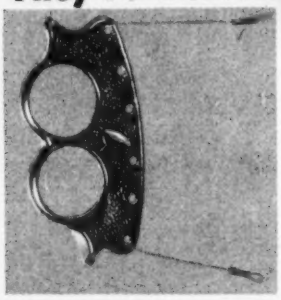

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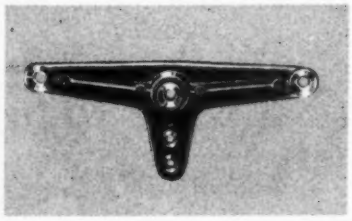

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vertical dive. To do loops and Immelmans the ship must be spiraled to build up speed. With the nose high turns, no loss of altitude is possible; therefore instead of making the right rudder control stop at 65 degrees from the vertical, we stop it at only 60 degrees. This allows the ship to enter into a spiral after a 270 degree turn. If the rudder is held on, the ship will spiral down building up enough speed to do a loop.

To move the mechanical stops it is only necessary to hold a hot soldering iron against the stop until the solder is fluid, then rotate the shaft to its desired position. The *Ruddervator* will now give ample control in the turns. Down control will cause a shallow dive, finally leveling out after speed is built up. Up control from straight flight will produce a slightly faster rate of climb. With plenty of forward speed it will produce a loop. Of the two controls, up and down, the down control is the most desirable. Loops or Immelmans can always be done after a high speed dive or spiral. There are three ways to make the down more effective. Increase the control tab area or bend the control tab at a greater angle to the airstream; both will cause rudder overcontrol. The third way and the answer, is to raise the front end of the whole *Ruddervator* about 1/8" higher than the rear edge. This will give down control position a greater angle with the air stream, but the rudder control positions will have only a little less effective nose up. In up position the control tab will be almost parallel to the air stream and will be useless at slow flight speeds; however at high speeds the control is effective enough to loop the ship. The down control will now produce a steep initial dive, and after speed is built up, the ship will shallow out its dive to about 30 degrees. With this high forward speed available, it is only necessary to release down and apply up control to make the *Javelin* loop. If an Immelman is desired instead of a loop, release the up control on top of the loop while the ship is inverted and apply right rudder. The *Javelin* will roll out into level flight just like a real ship.

For the beginner it is recommended that the *Ruddervator* be installed without the above changes. After experience is gained the changes can be made and a wider selection of maneuvers performed. Flight test procedures will be discussed next month. The *Ruddervator* should be bolted to its 1/16" plywood platform and cemented in place on the rear end of the fuselage with shaft parallel to bottom longeron. If the revamped model is to be used, then raise the front end of the *Ruddervator* 1/8" above the rear edge.

Cut out all parts for the rudder and assemble in place above stabilizer. Small strips of tin are used to hinge the rudder trim tab in place. These tin hinges will hold the trim tab in any position required. A piece of wire is cemented across the fuselage at the first vertical brace in front of the stabilizer. This wire should have a loop in center to hold the rubberband that rotates the ruddervator control selector. A small sheet balsa door is hinged with cloth tape at the fuselage section to allow winding of this rubberband.

Cut two long insulated multi-strand wires to run from the *Ruddervator* to the receiver. Solder then to the *Ruddervator* and twist together. Place them along the very bottom of the fuselage and spot cement every few inches. These two wires will later carry the current from the receiver to the *Ruddervator*. It is necessary to twist them together to prevent interference with antenna reception. Installation of the two-position self-neutralizing escapement or the four-position escapement is simple. Cut a 1/16" plywood former to fit against the fuselage uprights, one station in front of the stabilizer. Bolt or cement the escapement to this former. Linkage is shown on the plans; it is the same system used by Walter Good in his *Rudder Bug* (see June, 1949, MODEL AIRPLANE NEWS). The linkage and rudder should not bind in their travel but should be free and smooth. The rubberband to operate the escapement should be run forward to the left side of the cabin where it can be easily reached for winding. The rudder movement should be about 1/8" each side of neutral. Cloth hinges, similar to

U-Control hinges, can be used to hinge the movable part to the fixed portion of rudder.

The 1/4" hardwood dowels are cemented in place at front and rear of cabin. Use plenty of cement and small balsa blocks to brace the two dowels. Fill in around cabin windows with scrap sheet balsa and round the corners.

The cowling is completed next. Do not leave it off as it will add that realistic look so sadly lacking in most models, and cut down drag. The cowling is made from three soft balsa blocks. The two side blocks should be held snug against the engine and the center block carefully cut to fit between the two. Cement the blocks together and allow to dry. Carefully cut away inside of cowling so that it will slide over the engine. Then with cowl lightly cemented in place carve and sandpaper to shape. Remove cowl and give the inside a coat of half clear dope and cement. When this dries cut an opening for the exhaust stack and drill a hole for the needle valve. It may be necessary to solder a small wire extension to the needle valve to make adjustments easy. The finished cowl can be held in place by lightly cementing, or two "L" brackets can be made from heavy aluminum or soft iron, bolted to firewall and taped on sides for 4-40 screws. Small holes are drilled in cowl to clear the 4-40 screws and the cowling held in place with two bolts.

Next month we will complete the ship.

Official AMA News

(Continued from page 24)

Plymouth-sponsored meets, we feel that we can logically provide the opportunity for further record attempts at the Sixth International at Detroit next summer," Somerville said.

'52 PAA RULES CHANGED SLIGHTLY. The Pan Amercan World Airways' PAA Load event which started out in 1948 with only a Class B duration event has steadily grown more popular and the rules have been amended almost regularly to meet the ever changing demands. In 1949 the event was expanded to two classes, A and B, and in 1950 AA PAA Load was held at the National on an experimental basis. 1951 saw the official inclusion of AA PAA Load, the combining of A and B, and the addition of AA Clipper Cargo weight lifting event. This year, the events will be the same, but the required weight for AA PAA Load occupants has been increased to four ounces and Clipper Cargo models are required to carry an AA occupant.

For those of you unfamiliar with the PAA events, a quick rundown of the basic requirements is in order. First of all, whether for PAA Load or Clipper Cargo, AMA free flight gas rules apply except for "dummy" occupants and the requirement that models must rise-off-ground. Clipper Cargo and AA PAA Load models are required to carry one occupant consisting of a body at least 1-1/2" wide, by 2-1/4" high, by 3/4" thick and surmounted by a head at least 3/4 x 3/4 x 3/4". Class A models are required to carry one occupant and Class B models, two occupants, each composed of a body at least 3 x 3 x 1" surmounted by a head at least 1 x 1 x 1". Occupants, whether for AA, A, B or Clipper Cargo, shall not be essential to the operation of models and must be carried in an upright position relative to level flight, facing forward, and within an enclosed compartment. The "face" is considered to be on the broad side of the occupant. "Visibility" shall be provided through transparent areas to the front and to both sides of the heads of the occupants and occupants must be readily removable from the compartment for checking. Awards for Clipper Cargo are based on the amount of pay load carried for an official flight of 40 seconds or more.

Starting January 1, 1952, AMA will begin processing official PAA records for both PAA Load and Clipper Cargo models. To be eligible for recognition, flights must be made in AMA sanctioned competition in accordance with established PAA rules.

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Information on the third-party liability insurance for AMA chartered clubs and chapters which protects against claims for bodily injury and property damage arising from club or chapter activities can be had by writing Heber Smith Morris, Corner Pitt and Cameron Sts. Alexandria, Virginia. For AMA charter, your club secretary should write to AMA, 1025 Connecticut Ave., Washington 6, D. C.

WORLD RECORDS. The F.A.I. information circular number 57 announces the homologation of new records:

Orthodox Gas Models, Distance—356.794 km. (221.701 miles). Record established on July 22, 1951, by M. Gueorguy Lioubouchkine (Russia) using a model powered by a motor of 4.4 cc displacement. Note: This is both a World and World "Class" record. A World record is one which betters all other records for its type of performance; in this case, distance.

Flying Wing Gas Models, Distance—47.568 km. (29.557 miles). Record established by M. Leonide Lipinsky (Russia) on July 20, using a 1.8 cc motor.

Flying Wing Gas Models, R.O.W., Duration

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—33 minutes, 5 seconds. Established by M. Yury Ivanov (Russia) on August 9.

Orthodox Gas Models, R.O.W., Distance—130.597 km. (81.149 miles). Record establishd by M. Evgueny Koutcherov (Russia) on August 14, using a 4.4 cc motor.

Orthodox Gas Models, R.O.W., Control Line Speed, Class II (maximum limit of 5 cc displacement)—74.412 km/h. (46.237 mph). Established by Konstantine Semenov (Russia) on July 30, using a K-16 motor of 4.4 cc displacement.

Tommy Baker's jet record, information for which was given in last month's M.A.N., was also listed.

NATIONAL RECORDS PENDING. *Gas Model, Control Line Speed, Class A Open*—131.33 mph. Flight made by the team of George Mueller and Jim Nightingale, Tucson, Ariz., on October 28. A K & B *Torp .19* powered, their model, named *Winder*, which was designed by Mueller, weighed 12 oz., and used a 6D x 10P Tornado prop. Model features a half pan of aluminum alloy, 1-1/4" spinner, 12-3/4" overall fuselage length, helmet cowl, no rudder, .012" aluminum wing with line lead-outs swept forward, 1/4" thick airfoil, counter-clockwise flight, and tapered wing with approximately 12" span and 2-1/2" root chord.

Free Flight Gas Model, R.O.W., Class C Senior—8.25.4. Flights made by Eugene P. Wallock, San Gabriel, Calif., on October 28. The model, a *Sandy Hogan*, was powered by a *Torp .32* with a 11D x 5P Tornado prop and weighed 36 oz.

Outdoor Hand-Launched Gidler, Class A Junior—7:47.1. Flights made by Johnnie S. Werts, Jr., on November 10. Using a model designed by Homer Werts. Model has 18" wing span, poly dihedral, tapered wingtips with 3-1/2" root chord and 2-1/4" tip chord, 27% stabilizer, and 18" fuselage.

ATTENTION CANADIANS! The Model Aeronautics Association of Canada is the modeling representative in Canada of the F.A.I. and, as such, issues licenses, sanctions, etc., as the AMA does in the United States. In view of the fact that many AMA members living near the Canadian border desire to attend MAAC sanctioned meets and vice versa, a reciprocal arrangement has been worked out whereby AMA members may compete in Canada without MAAC license and MAAC members may compete in the U. S. without AMA license. Canadians should write to James W. Graves, Secretary, Model Aeronautics Assn. of Canada, 1555 Church St., Windsor, Ont., for license information.

The *Western Associated Modelers* report that at the Club Team Stunt Meet for the Robbers Challenge Trophy, variations in judging between the two judges were quite marked. As a result of the discussion which followed, it was decided to conduct a stunt judging school right on the field. The purpose of the school is not only to educate the judges but also to enable the WAM Stunt Rules Committee to better understand the problems involved in setting up a standard judging procedure and, if possible, to reword the stunt pattern rules in such a manner as to afford a clean-cut meaning with only on reasonable interpretation. When the results are shown, they will be passed on to the AMA Control Line Precision Acrobatics Rules Advisory Committee.

CONTESTS

APRIL

27—*Baltimore, Md.* Class AA Cancer Fund Benefit Contest for radio control models—also demonstrations of all types of model flying. James F. Snyder, Contest Director, 3107 Normount Ave., Baltimore.

JUNE

8—*Lexington, Nebr.* Class AA Nebraska State Stunt Contest. Donald R. Ross, C.D., Lexington.

AUGUST

3—*Waynesboro, Pa.* Waynesboro Exchange Club Meet. Pending.

20-25—*Detroit, Mich.* Class AAAA Ltd. 6th International Model Plane Contest. Pending.

SEPTEMBER

1—*Far Hills, N. J.* Bedminster-Far Hills Lions Club 5th Annual Control Line Meet. Pending.

21—*Waynesboro, Pa.* Waynesboro Exchange Club Meet. Pending.

THE END

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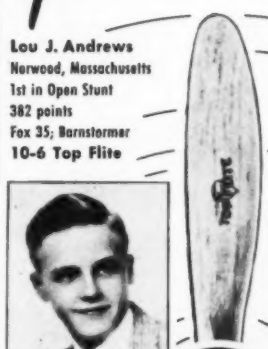

Don Ferguson, Jr.
Newtonville, Massachusetts
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389.5 points
Fox 35; Barnstormer
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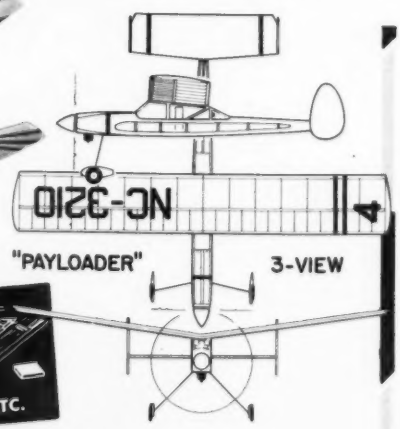

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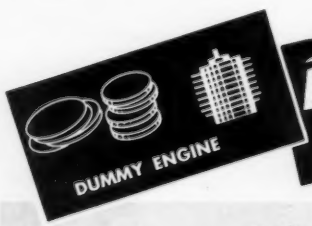

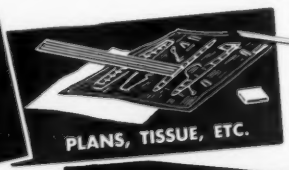

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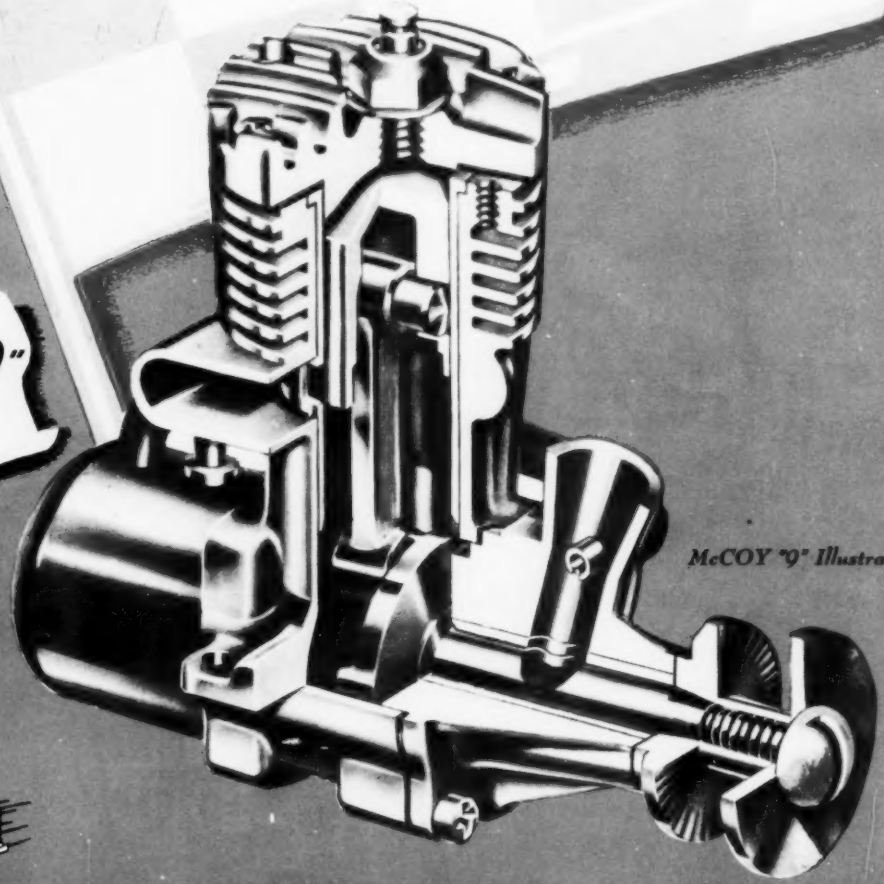

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